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ADDRESS OF WELCOME: CANADIAN SOCIETY OF ANESTHETISTS, 1925.*

A. PRIMROSE, C.B., M.B., C. M.,
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In extending a welcome to the Canadian Society of Anesthetists, on the occasion of their Fifth Annual Meeting in Toronto, I am reminded of the debt we surgeons owe to those who have specialized in anesthesia and who, by so doing, have made it possible for us to proceed with our operative work in complete confidence that, as far as the anesthetic is concerned the life and well-being of the patient is safeguarded to the extent that human skill and efficiency will permit. I speak of this somewhat selfish attitude of the surgeon because I verily believe the advent of the modern anesthetist has been a very potent factor in advancing the science of operative surgery. The surgeon when he has complete confidence in the ability of the anesthetist is capable of using better judgment and of doing more efficient work because his mind is free for concentration on his operative work. Moreover the intensive study of anesthesia by specialists has had a profound effect in reducing mortality and avoiding complication both at the time of administration of the anesthetic and subsequent thereto. The postoperative mortality and the postoperative complications have been diminished greatly by the choice of anesthetic and the skill in administration.

COOPERATION AND TEAMWORK

One does not mean to suggest an entire absence of responsibility for the anesthetic on the part of the surgeon. There must be cooperation and teamwork if the best results are to be obtained. The anesthetist watches the pulse, the blood pressure, the respiration, etc., and is in a position to inform the surgeon on the general condition of the patient during the various steps of the operation. The surgeon on the other hand should keep the anesthetist in touch with the extent of the procedures he proposes to undertake and to consult with him as to the degree of shock or collapse which may be anticipated, depending upon the seriousness of the undertaking in relation to the resistance of the patient and his ability to withstand it.

One may contrast the conditions which exist today with those of say thirty years ago. When a student in Edinburgh in the eighties one was taught to administer chloroform, to the exclusion of any other form of anesthesia. I would have you note that the anesthetist was always a student in the final years. Moreover the only supervision exercised was by the surgeon or his assistant both of whom were engaged in the operation, but who were trained to be alert to any untoward symptoms which might indicate that the patient as taking the anesthetic badly.

It will surprise many of you, trained as you are to recognize the narrow margin of safety in administration, that fatalities were extremely rare: so rare that the Professor of Surgery, at that time a man of wide surgical experience, was able to state that he had never had a death under anesthesia. Such is the history of the administration of cholorform in the Edinburgh Royal Infirmary. I only saw ether administered twice while attending the surgical wards. Each student in turn was required to act as anesthetist and to administer the anesthetic.

One may well inquire how it came about that chloroform was so safely administered by students in those days in Edinburgh. The explanation is found in the fact that the surgeon was trained from his student days to watch the effect of the anesthetic on his patient: more particularly the respiration. Some of you interested in the history of anesthesia will recall the long series of experiments carried out by Sir Lauder Brunton to determine whether the heart or the respiration failed first during chloroform inhalation. He gave his verdict in favor of the latter and it was to the respiration the Edinburgh surgeons paid most attention in chloroform anesthesia. The surgeon as he proceeded with his operation never failed to detect danger signals: he was always on the alert and was in reality responsible for the safe administration. Not very long ago I asked an Edinburgh surgeon, who had recently retired, if it was not a great strain to carry the responsibility for the anesthetic when engaged in operating. He answered in the negative. He explained that early training and constant training had made it easy. Without any effort on his part he automatically noted any change in respiration or in the condition of the patient which might indicate trouble. It was almost a reflex response on his part after long experience without conscious effort.

There are times when the system of making the surgeon responsible for the anesthetic is of distinct value. Every surgeon is called at times to operate in some remote country district where the services of a skilled anesthetist are not available. The modern surgeon is apt to be so engrossed in his operation that he may fail to observe the progress of events as far as the anesthetic is concerned. The result may be disastrous should the one administering the anesthetic be inexperienced. Under such circumstances the old Edinburgh method of training the surgeon to watch the anesthetic has a distinct advantage.

Those days have passed in Edinburgh. Chloroform is no longer used to the exclusion of ether and nitrous oxid-oxygen. The methods of administration have been and will continue to be changed as more ideal methods are elaborated. Trained anes-

*Read during the Fifth Annual Meeting of the Canadian Society of Anesthetists with the Ontario Medical Association, King Edward Hotel, Toronto, May 5-8, 1925.

thetists exist in the Scotch Hospitals as elsewhere. The specialist in anesthesia is now universally recognised as one of the most valuable and essential products of the evolution of modern medicine.

The writer, in the early days of his career, when a recent graduate from Edinburgh, was proud of the fact that he obtained an appointment as "Pathologist and Chloroformist" to one of the London Hospitals! I may therefore claim to have had something of the rank of a specialist in anesthesia! I trust you will not assume that the conjunction with Pathology meant that I was expected to follow my subjects of anesthesia to the dead house. One admits it was rather suggestive but fortunately the mortality, during my term of office was nil!

Recent Advances

Of recent years great advances have been made in the employment of anesthetics. The induction of general anesthesia by the employment of nitrous oxid gas was suggested over a century ago by Sir Humphry Davy. We may quote his own words, written in 1800, when he said "as nitrous oxid, in its extensive operation, seems capable of destroying pain, it may probably be used with advantage in surgical operations in which no great effusion of blood takes place." It is only during the last few years that nitrous oxid gas has been used in the performance of extensive operations. This has come about because of more precise knowledge of its therapeutic effect, more particularly when administered in combination with oxygen and because of better apparatus to secure its safe and effective administration.

It is interesting to recall the fact that it was Faraday who first showed, in 1818, that the inhalation of the vapor of ether produced similar effects to that of nitrous oxid gas. The administration of general anesthesia has reached a high stage of specialized development; induced in a variety of methods, by inhalation from a mask, or through a tube introduced into the air passage or by the rectum. These different methods are valuable under conditions varying with the demands of operation and the idiosyncrasies of the patient.

While methods of inducing general anesthesia have undergone remarkable development, because of improved technic, of recent years, we recognize that methods of producing local anesthesia have been subject to even greater evolutionary change. Block anesthesia in its various forms has attracted wide spread attention and is destined to occupy a position of increasing importance in the future.

Specialists in Anesthesia

The general surgeon today is of necessity vitally interested in the subject of anesthesia and in the various methods of administration. It is however, recognized that we must look to the group of specialists, who are working in this interesting field, for further advances. The general surgeon has almost come to the point where it is the choice of the anesthetist rather than the choice of the anesthetic which concerns him! Forunately in all our hospitals throughout the Dominion we have groups of men and women who are devoting their lives to the study of this important subject and we look to them for further progress in a field of service the value of which cannot be overestimated in the relief of human ills and in the prevention of suffering.

What a boon it is to the poor victim of disease or injury when he has to undergo an operation to find that he is in the hands of someone skilled in the modern methods of controlling pain. The patient without fear or foreboding and with complete confidence relinquishes himself to the care of the anesthetist until—

"O'er woes long wept
Oblivion softly lays her shadowy veil."

We recognize the fact that the presence of a trained anesthetist gives the patient confidence, this, with the skilled administration which is in vogue nowadays, is a potent factor in the control of nervous excitement and the diminution of shock. The efficient and skilful anesthetist is a most important factor in the success of our surgical undertakings.

It is with great pleasure I accede to the request of your Chairman. I extend a most hearty welcome to you on the occasion of your meeting in Toronto. I trust you will enjoy your visit and that among your colleagues in this city your deliberations may result in further progress towards the attainment of the ideal in your chosen field of professional service.

100 College St.

ETHYLENE IN POOR RISK CASES.*

John E. Cannaday, M.D.
Charleston, W. Va.

Since October, 1923, we have been using ethylene anesthesia, particularly in our poor risk surgical cases, and have found it so satisfactory that I wish to make a few comments concerning its advantages:

Certain Advantages

The *quick anesthesia,* the patient being unconscious in 30 seconds usually after its initial administration, though not fully relaxed until a few minutes afterwards.

The *absence of sweating and cyanosis.* The absence of irritating effects on the lungs or the kidneys and the absence of blood pressure rise, give it obvious advantages in a certain class of cases in which we have previously tried to struggle along with local anesthesia and nitrous oxid.

*Read during the May, 1924, meeting of the West Virginia Medical Association, Wheeling, W. Va.

It has certain disadvantages such as: Not the complete relaxation seen with ether or chloroform. Also inflammability and explosiveness under certain conditions. Like nitrous oxid, it necessitates the services of a skillful anesthetist.

Our observations are that in point of ideal and practical anesthesia, that it comes midway between nitrous oxid and ether and as such displaces nitrous oxid for all practical purposes.

I want to call your attention to its marked advantages in cases complicated by tuberculosis, diabetes, nephritis, hypertension, toxic states, also bad cases of empyema, etc. The coagulation time of the blood remains unchanged. There often seems to be more oozing at the operative site however, than with other anesthetics. It does not act as an irritant to the respiratory tract so that the increase in mucus and saliva is very slight. Pulmonary complications should, therefore, be reduced to a minimum with its use. Since the danger from explosion has not yet been definitely determined, we have refrained from the use of the cautery, free flame or any source of electric discharge.

DRAWBACKS

The chief drawback is a certain amount of muscular rigidity which seems to be characteristic of this anesthetic. In this respect, it is probably intermediate between nitrous oxid and ether. A surgeon who for years has been accustomed to the freedom of manipulation and the ease of closure which ether affords may find it impracticable to operate under ethylene-oxygen. We have found it necessary to use ether or local anesthesia, and often both in order to secure sufficient relaxation for abdominal operations. When a sufficient quantity of ether is added at the proper time, the resulting anesthesia is of an excellent quality, and it seems likely that such a combined anesthesia offers a greater margin of safety to the poor risk patient than a straight ether anesthesia.

STATISTICAL DATA

Up to May 1st, 1924,* we had used ethylene-oxygen anesthesia in the following cases:

810 Ethylene anesthetics (220 inductions)
Ages 17 days to 75 years.
Duration, two minutes to two hours.

Laparotomy	212
Gallbladder	26
Hysterectomy	8
Pyloroplasty-Horsley	1
Hernia	24
Chest Cases	13
Prostatectomy	3
Enterostomy	14
Gun shot abdomen	3
Nephrectomy	3
Vaginal Operations (Watkins, Perr. and Trach.)	8
Cesarean Section	3
Mastoids	5
Tonsils and Adenoids	26
Spina bifida	1

The remainder were lacerations, dislocations, abscesses, D & C hemorrhoids, extraction of teeth, examinations, etc.

SOME POOR RISK CASES

Case 1. *Mrs. D.* Patient suffering from acute obstruction of common duct probably for six weeks, extreme jaundice, nausea. Patient 65 years of age, emaciated, pulse very weak, 120 prone position.

Operation: Right upper abdominal section. Findings: Very hard induration head of pancreas, highly suggestive of carcinoma. Gall bladder palpated, no stones found. Unable to palpate any stones in common duct.

What was done: Cholecyst-gastrostomy with small Murphy button. Patient returned in state of shock. Reacted well, however, and jaundice disappeared to a great extent within ten days. Patient made rapid improvement, gained in weight and has been living in a fair state of comfort for three months since.

Case 2. *Mrs. I.* Large empyema left side, history of three years' duration. Previous attempt at drainage about two years ago. Patient had bronchial fistula, part of pus is discharged through sinus in back, larger portion coughed up. Patient has been in bed since last December, emaciated, pulse 110 or higher all the time, night sweats, constant cough.

Operation: Resection of from four to six inches of five ribs, scapula turned up over shoulder, cavity extends almost to apex of chest, nearly a quart of thick pus in cavity, mediastinal wall flapping in cavity. Patient returned to bed apparently in fair condition, developed profound shock that afternoon but reacted fairly well, improved very rapidly, wound treated by Dakinization, patient began sitting up in chair week after operation and sent to her home in city eleven days after operation. Pulse last three days before leaving hospital, 84 to 92, temperature does not exceed 99½° F.

Case 3. *S. H.* Boy 12 years old sent to hospital. Diagnosis: Acute valvular disease of heart, chronic nephritis, empyema of six weeks' duration, average pulse rate 140, respiration rate 28 to 32. Empyema diagnosis confirmed by *x*-ray and by aspiration. Thick pus aspirated. Small rubber tube inserted between ribs.

Six other cases of empyema, some of them children, others adults, have been operated on under ethylene-oxygen anesthesia, all seriously ill. Chest

*(Foot Note)—From May 1, 1924 to Feb. 1, 1925 ethylene-oxygen has been used in approximately 900 cases without mishap or untoward result.

drainage done without shock, suffering or chest irritation.

Two recent cases of acute hyperthyroidism with resection of thyroid tissue, patients reacted well and satisfactory recoveries followed, pulse rate previous to operation 130 to 140. Within week after operation dropped below 100.

Two cases of Cesarean section, one for placenta previa. The other, a severe case of eclampsia, in which delivery had been attempted but failed. Both made good recoveries.

Six or more cases of intestinal obstruction, some of them in extremely poor condition treated by enterostomy either single or multiple with fair results.

We have made extensive use of ethylene-oxygen anesthesia in cases of compound fractures of legs, profound shock, also in various cases in which patient's condition was complicated with pulmonary tuberculosis, etc.

Opinions of Others

I quote opinions from the following authorities:

Lewis[1]: "At the present time we have had about 2400 ethylene anesthetics at the Presbyterian Hospital. It has been very satisfactory indeed and I think it has had its greatest advantages in poor risk surgical cases. I have used it in tuberculosis of the lungs and the patient got along beautifully. I also used it in cases in which there has been a low hemoglobin count. We have found no contraindications to this anesthetic up to the present time but I suppose some contraindications will arise at any time. I believe that the general condition of the patient is much better after this than after any general anesthetic now in use." . . .

Trout[2]: "Very briefly my views are that ethylene has probably come to take the place of nitrous oxid-oxygen. I do not think it will ever take the place of ether. There is one class of cases in which I am convinced ethylene is of a great deal of value and that is in the diabetic, for Luckhart has shown that ethylene reduces the blood sugar even in normal individuals, while our experience has demonstrated very clearly to us that there is a marked reduction of blood sugar due to ethylene in the diabetics on whom we have operated. Of course, some of this has been due to insulin." . . .

Heaney[3]: "I find ethylene very well suited to major gynecologic and obstetric procedures during delivery, examination, etc. I have been making frequent use of ethylene for pelvic examinations in office and dispensary patients and find it very satisfactory for this purpose. My observations are similar somewhat to those of other observers, in that I consider ethylene anesthesia to rank mid-way between nitrous oxid and ether. The patient is usually ready to return home in from ten to thirty minutes after ethylene has been given for the purpose of relaxation during pelvic examination. I have made extensive use of this anesthetic agent in conjunction with simple forceps deliveries, also in difficult forceps cases.

I wish to call attention to the advantage of ethylene anesthesia in that it does not cause any perceptible rise of the blood pressure. The inflammability of ethylene corresponds to that of ether-oxygen."

Brown[4]: "It would take more than six hours continuous anesthesia in a tightly closed room entirely free from ventilation to bring about an explosive mixture with the room atmosphere. My experiments show that a 5 to 97 degree mixture of ethylene with air is explosive. The maximum explosiveness is reached when three parts of oxygen to one of ethylene are used. There is no danger of an explosion of the gas when compressed and in a pure state. The combination of nitrous oxid-ethylene mixture often used for anesthetic purposes is quite as explosive as ethylene, it has been proven." . . .

Lundy[5]: "Ethylene is being used most extensively in Chicago, Toronto, New York, Baltimore, Rochester, Minn., St. Louis, San Francisco, Los Angeles, Seattle, Tacoma and many other cities throughout the country. Ethylene is especially valuable in the case of the weak patient and the poor risk case owing to the slight physical depression that this anesthetic causes. Ethylene is also exceedingly valuable in cases of chronic hypertension owing to the well established fact that it has very little effect on the blood pressure while nitrous oxid and ether both raise the blood pressure to a very marked extent. In these cases ethylene temporarily lowers the blood pressure to a very marked extent.

Ethylene is particularly advantageous in bad heart cases, cases of acidosis, diabetes, and nephritis."

There is a very large gap between nitrous oxid and ether, and ethylene divides this half way.

Judd[6]: "We began the use of ethylene-oxygen anesthesia last August and since then have used it in upwards of 2500 cases covering fairly thoroughly the entire field of general surgery. Thus far our experience indicates that it is an exceedingly safe anesthetic agent. It is agreeable to take, quick in action, and affords prompt recovery with a minimum of unpleasant and harmful after effects." . . .

Kiwana Banking & Trust Co. Bldg.

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ANESTHESIA FOR THE GOITER PATIENT*

CARL F. DENMAN, M.D.,
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The best results in surgery are impossible without proper anesthesia, and the anesthetic plays a very important role in the outcome of many surgical operations.

In dealing with the problem of anesthesia for the goiter patient, particularly the toxic goiter type, we have many things to contend with which are entirely absent in any of the other fields of surgery. It is the seeming trivial details which must be constantly observed and carried out, in order that successful results may be accomplished in these cases, many of which we must recognize are very ill.

PRELIMINARY TREATMENT

Usually toxic goiter patients come to the hospital apprehensive, alarmed, and in imminent fear that they will not survive the operation. If they come from distant points to a strange city, and are away from their relatives and friends, this nervousness is often exaggerated. The patients are nervous to a degree, and because of this condition, and to the rapid heart action, and other manifestations of thyroid toxemia, a smoother convalescense is possible, and the danger of a fatality more certainly prevented, if operation is postponed for a number of days after the patient enters the hospital. A week or more of preliminary treatment may be required before operation is advisable or safe. This affords an opportunity for the anesthetist to see the patient a number of times before the operation, and this getting acquainted with the patient is very desirable.

The toxic cases must have rest in bed with ice bag over the heart, and also over the thyroid enlargement, until toxemia is reduced, and the pulse rate comes down. The administration of sodium bicarbonate in capsules, and of digitalis to the point of digitalization, as a routine procedure is recommended as of considerable importance and benefit. The question of acidosis must be considered, and after operation sodium bicarbonate, sodium bromid and glucose per rectum are advisable.

PREOPERATIVE PREPARATION

The goiter patients are never told when they are to be operated upon, as a good night's rest before operation is essential. Veronal gr. 7 is given in capsule at 5 o'clock the night before operation, instead of the capsule of sodium bicarbonate, the patient of course not knowing of this substitution, and the same dose of veronal is repeated at 9 p. m. if the patient is not sleeping. The first intimation the patient gets as to the time when the operation is to be performed is in the morning when the first preliminary hypodermic is given. The preliminary medication consists of the veronal given the night before, which still has some hang over the next morning.

At 6:30 a. m. the first preliminary hypodermic is given of morphin gr. ⅛ and hyoscin gr 1/150, and at 8 a. m. the same dose is repeated hypodermically, if the first dose has not had the desired effect, before operation, at 830.. The morphin and hyoscin are prepared in solution as follows:—Hyoscin hydrobromid gr 2/9, morphin sulphate gr. 4, saturated solution boric acid oz. 1. A dose of 15 minims of this solution given at each hypodermic injection provides the proper dose of each drug. By this method the dose is more uniform in our hands, than the hypodermic tablets of morphin and hyoscin.

The toxic goiter patient should always be operated upon early in the morning, and should have priority over other work which may be scheduled. A long wait before going to the operating room may increase nervousness and send the pulse rate up to a point where operation is not advisable. The patient should be moved to the operating room without noise or commotion, and in the operating room the minimum of talking is maintained until the patient is under the anesthetic.

The operating table is so adjusted that the patient is in a semi-sitting position. In this position less oozing from the small vessels occurs, and a position of extension of the head backward is more easily obtained, which position is more favorable for an easy delivery of a deep-seated growth below the sternum.

The final cleanup of the neck is made on the table, and the gas is not started until the sterile drapes are in position. This saves a considerably length of time, approximately fifteen minutes, and obviates keeping the patient under the anesthetic any longer than is absolutely necessary. In this connection, speed on the part of the operator and the time element of keeping the patient on the table, are very important in the weak heart cases. A phonendoscope strapped over the apex of the heart gives more accurately the heart condition during anesthesia, than pulse at the wrist or temple. After starting the anesthetic, if the patient does not go under well, or if at any time during the operation the patient is too restless, morphin gr. 1/6 may be given hypodermically. However, this extra hypodermic is very rarely necessary.

SELECTIVE ANESTHESIA

Nitrous oxid-oxygen is the anesthetic of choice, no other anesthetic being used. After the patient is under the gas, local anesthesia 0.5 per cent novocain may be injected by the operator into the field of operation, subcutaneously and into the deeper tissues. Although the local anesthetic is often unessential, in many cases it adds to the smoothness of

*Read during the First Annual Meeting of the Eastern Society of Anesthetists, Hotel McAlpin, New York City, October 20-24, 1924.

the general anesthetic, due to the fact that the gas-oxygen is a light anesthetic. In some instances of small nontoxic goiter, local alone may prove very satisfactory, but the large goiters, and the toxic cases can be operated much more rapidly under general anesthesia.

Contraindications

There are some notable contraindications for anesthesia or operation in cases of thyrotoxicosis, which it is necessary to consider. The symptoms of toxic goiter should always be born in mind, and if certain combinations of these symptoms are present, it is not advisable to administer an anesthetic or attempt operation:—

First.—The cases in which the apex beat does not come down to 150 or 160 per minute, after anesthesia has been maintained long enough to get the patient well under the anesthetic. This count should be taken with a phonendoscope over the apex and not by the pulse at the wrist, as there may be a *pulse deficit.* The pulse should show little or no irregularity or intermittance especially if rapid. After the patient has become thoroughly anesthetized there is usually a marked decrease in the pulse rate, amounting to thirty or more beats less per minute. The weak heart cases, after a treatment in the hospital, may show a decrease in the rate to a pulse rate of 100 in the ward, but the rate may go up to 200 or more when they come to the operating room, or in fact as soon as they are aware that operation is to be done, and of course in such instances they should be sent back to the ward without operation. It is not uncommon to send them back two or three times, for a few more days rest and treatment before it is safe to operate. However, the anesthetic may be started in these cases if the pulse rate is not too fast, and if after a few minutes of anesthesia the pulse comes down, a short operation of ligation of the superior thyroid arteries on one side may be done. If ligation of one side can be accomplished, the patient will invariably show sufficient improvement so that excision of the goiter may be done later, or at least a second ligation on the other side.

Second.—Patients should not come for operation with a pulse deficit. That is to say the rate of heart beat at the apex with phonendoscope must correspond in frequency with the pulse rate at the wrist. Toxic cases may have a pulse deficit upon entering the hospital from 20 to 40 per minute. This deficit must be overcome and the rate decreased before considering operation.

Third.—The patients with the predominating symptoms of digestive disturbance, nausea, vomiting, and diarrhea are not now operated upon until these symptoms have entirely disappeared. The goiter patients with digestive disturbance are among the very poorest risks as it is an indication of profound toxemia, and the postoperative condition is often very desperate or fatal, even though the other manifestations of toxemia may be comparatively mild. Our records show that in all of the instances of death following operation, every such case has had the digestive disturbance symptoms, although in some instances the other symptoms of toxemia have been very favorable for operation.

Fourth.—The blood pressure should be reduced in the very high blood pressure cases, and local anesthesia is preferred in these cases as there is less venous oozing during operation, or if gas-oxygen is used, a very light anesthesia maintained.

Fifth.—Patients with a very high metabolic rate are usually bad risks, providing the other toxic symptoms are pronounced. A metabolic rate of over plus 35 or 40 per cent necessitates rest in bed and postponement of operation.

Sixth.—The lymphocyte count should be taken into consideration, and a decided increase in lymphocytes of 40 per cent or over indicates presence of a decided toxemia. It is a notable fact that increase in lymphocytes is often if not always present in the patients with digestive disturbances. However, the lymphocytosis is of less importance than other manifestations of thyrotoxicosis.

As a general rule no one symptom can be relied upon wholly in making a decision as to when operation is safe, but all of the evidences of toxemia in a particular case must be taken into consideration, and each case decided on its own merits.

Further Details

The administration of the anesthetic itself as given to the toxic goiter cases is often not as difficult as is experienced in the cases of large simple goiters with pressure symptoms on the trachea, or in the cases of large intra-thoracic goiters. Ether or chloroform anesthesia is especially contraindicated in cases of pressure symptoms, notably instances of deep substernal growths. As a growth in this situation is delivered through the aperture of the thorax, the anesthetic must often be discontinued, or oxygen only given to allow the patient to come out sufficiently to help himself. In this situation the breathing is at best very bad, because as the operator pulls the goiter up from below the sternum pressure upon the traches is sufficient to stop respirations. It is in such a situation that gas-oxygen has a distinct advantage over ether, chloroform or colonic ether-oil anesthesia, because the reflexes can quickly be restored if gas-oxygen is used. The surgeon may work for a time in freeing the growth and then let it back into the sub-sternal position until the patient has had time to take a few more respirations.

The Kocher frame attached to the operating table affords an opportunity to drape the patient with,

sterile sheet in such a manner that the field of operation is protected, allowing the surgeon plenty of room, and also affording the anesthetist plenty of space to adjust the mask, and opportunity to observe the color of the patient during anesthesia.

Team work and the cooperation of the surgeon in handling these very trying cases, will bring about uniformly good results in practically every instance, instead of less fortunate an outcome if great care and good judgment are not exercised.

126 EAST STATE ST.

GENERAL ANESTHESIA IN BAYLOR HOSPITAL: METHODS AND COMPLICATIONS*

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In presenting this paper the writer does not seek especially to present anything new but wishes to describe those methods of administration of general anesthesia and give some statistics of end results that may be of interest.

Our general anesthesia agents are practically limited to nitrous oxid, etyhlene and ether. Chloroform is prohibited, except by the order of the surgeon, or physician in a specific case and is then used on his personal responsibility. Ethyl chlorid and allied agents are not deemed necessary and are not used with nitrous oxid and oxygen available.

With the mentioned anesthetic agents and their various combinations; with suitable hypodermic premedication in adults; and in many cases also the combined use of novocain infiltration of the tissues, we believe we are able to secure a pleasant, safe induction, a suitable maintenance for all operative needs and a recovery devoid of the dangers and discomforts so common in the past after general anesthesia.

HOSPITAL EQUIPMENT

Nitrous oxid, oxygen, air pressure for ether insufflation, and vaccum for suction are supplied to each operating room under low pressure from a supply room in the basement. On a pedestal at the anesthetist's right there are gauges and hand valves from which the N_2O and O_2 are withdrawn as needed, and the air and vaccum are also used as desired. Ethylene is supplied in tanks in the operating room because of less danger of leaks and explosions.

We use both N_2O and ethylene with oxygen by the method of rebreathing and with the intermittent withdrawal of the gases by hand, the proportions being approximated and not measured or delivered by percentage, but supplied as indicated by the degree of anesthesia present on the one hand, and the oxygen demands of the patient on the other.

*Read during the Third Annual Meeting of the Southern Association of Anesthetists, with the Southern Medical Association, St. Charles Hotel, New Orleans, November 24-26, 1924.

Our apparatus is of the simplest type, and of our own construction, consisting only of a rebreathing bag, a celluloid face piece and an ether drip cup interposed between. There are no complicated mixing valves or other machinery to manipulate, thereby allowing the anesthetist to give all his care to the patient. At the same time there is no complicated machinery to so far automatically administer the anesthetic that the anesthetist may put a dangerous degree of dependence upon it.

This apparatus works uniformly at every pedestal where through a double Y both the gases N_2O and O_2 ether vapor and air are delivered through a common rubber tube to the bag and facepiece and also through which either, or all three may be used by insufflation through an airway to the phalynx, or the ordinary J tube intraorally. With this arrangement we are enabled, after inducing full anesthesia with the closed apparatus, to change to insufflation by allowing sufficient quantity to flow to displace the air, and with our specially devised throat tube are able to anesthetize for goiter and other operations and also through intraoral insufflation by the air displacement method to do tonsillectomies without the addition of ether where ether is contraindicated; however, most of our tonsillectomies, nasal and face operations are performed under light ether insufflation often with the addition of N_2O.

We are also able to give the gases under pressure, and to use oxygen for inflation of lungs in artificial respiration with this apparatus.

The gases and air are available at about 10 pounds pressure and vacuum at 5 to 12 inches and this, I believe, is a necessary safeguard wherever a general anesthetic is administered to protect the respiratory passages from excessive secretions, blood, or vomitus, and also for the removal of the blood in intranasal, intrapharyngeal, mastoids, sinus and other operations.

SELECTIVE ANESTHESIA

We believe that it is as much an error to attempt to give one anesthetic agent for all patients as to give quinin for all cases of fever. We have all seen anesthesia attempted with gases alone that would have been far better if replaced by ether, alone or added in combination, and such attempts doubtless account for many of the disasters that have occurred with their use. However well-indicated a certain anesthetic agent may be conditions may arise from special idiocyncracies in the patient that render it intolerable, and its forced use may result in harm to the patient. Therefore, without some special contraindication, since ether, N_2O and ethylene are all apparently equally safe agents, we should be prepared to use both the agent and method most suited to each particular patient and operation.

Premedication

A hypo of morphin 1/6 gr. and atropin 1-500 gr., 30 minutes prior to operation, is our routine for those patients over 15 years of age. Since these drugs are best known in their action, we prefer to give them without synergists such as magnesium sulphate and scopolamin and allied drugs for fear of undue respiratory depression.

Administration

All general anesthesia is induced with N_2O and O_2. The bag is drawn nearly full of N_2O and a small quantity, approximately 10 per cent of oxygen is added by the 3rd or 4th breath. This removes all possibility of a suffocating feeling; then the N_2O content is increased over this proportion as indicated and the oxygen is added always in sufficient quantity so that cyanosis does not occur.

This mixture is rebreathed from the beginning, the bag being partially emptied and refilled practically as before, every two to five minutes as the respiratory response to the CO_2 demands. Leakage of the apparatus usually takes care of this factor.

When anesthesia is fully established it may be thus continued, or switched to ethylene, or ether may be added from the drip cup attached to either of the gases; or if after the addition of a few drachms of ether the surgeon, or for any reason the anesthetist desires, the closed method may be changed without interruption to the so-called open ether method.

The addition to the gases of a small amount of ether sufficient for relaxation in laparotomies when done early gives the best results, and, furthermore, the ether may be so thoroughly washed out of the patient's system by the time the operation is concluded by continuing the anesthetic with the gases that it does not delay recovery much beyond that of the gases used alone. Since ether is now given by the modern method of variable maintenance with due regard for the proper stages for each operative measure and steps in the technic of the same, there is such a small amount of postanesthetic discomfort, nausea, and vomiting and, furthermore, considering the efficiency and safety of ether, it is not necessary nor justifiable to use the gaseous agents exclusively, with which we must supply a restricted respiratory formula that not only anesthetizes but also must maintain the respiratory function, unless an easy compatibility exists that works no hardship on the patient, especially where satisfactory anesthesia cannot be had without partial asphyxia with cyanosis; and when the respiratory center may respond too energetically with the closed method, thereby over working the respiratory apparatus, with ultimate exhaustion or depression to a harmful degree.

Gas-oxygen anesthesia, for more than a slight or momentary operations, should have the advantages of efficient premedication with morphin, for both the supplemental narcotic effect and the suppression of over-respiratory efforts incident to the closed method, and the necessary addition of ether to either nitrous oxid or ethylene, if they are insufficient, that there may not be the necessity of harmfully forcing the gases.

Statistical Data

From the more complete records of our general anesthetics in surgery I find that during the last few months we are using the different agents and combinations of same in the following proportions:—

N_2O and O_2 about 8 per cent. The operations for which it was formerly used being greatly replaced by ethylene and O_2 which is given in about 42 percent and nitrous oxid and oxygen in combination with ether and constituting the remaining 50 per cent. This latter combination including tonsillectomies, mastoids, sinus, and intra-nasal operations which greatly adds to their number. Vomiting occurs in 5 to 10 per cent of cases unless due to the use of morphin or the manipulations of the operation.

We have administered 4,387 general anesthetics since January 1, 1924. In this series I find four cases of pneumonia, two of which had bronchitis, one rather acute, the other in resolving stage. Both had acute appendicitis requiring emergency operations, one at 3 a. m. and just admitted. There is no special information of the other two, except that three of the four recovered and one was improving and developed obstruction of the bowels from which he died 5 or 6 days after the operation. We have had no abscesses of the lungs from tonsillectomies.

In looking over the records since May 1, I find four cases of postoperative shock. On careful analysis of these cases, extreme conditions were revealed prior to operation, such as hemorrhage etc., and in none was the anesthetic considered a factor.

There were also some other respiratory complications, a few of which I will briefly report since they were formerly confounded with anesthetic complications.

A death during May from pulmonary infarction; as usual following hysterectomy for multiple fibroids, and three days after operation.

During June, death from pulmonary edema in a goiter operation after nitrous oxid and oxygen with novocain infiltration.

A male patient, 56 years old, died seven days after operation of pulmonary embolus; immediately after being put up in wheel chair.

In October one death, a female patient, aged 41, complete extraction; and emphysema noted as operation was being completed.

Autopsy revealed chronic miliary tubercles throughout the lungs which had undergone calcifi-

cation and around which the alveoli had ruptured, the air thus entering the mediastinum, and thence downward to the peritoneal cavity and upward through tissues of the neck to the face. There was no inflation of the stomach and bowels and no air could be found on immediate introduction of stomach or rectal tube. Ether vapor was insufflated through a catheter in the nose; the mouth was packed with gauze as usual and no obstruction of egress of air was noted during the operation. Anesthesia was normal. The alveoli ruptured around the calcified masses from momentary pressure added, or from increased respiratory movements during anesthesia. The left lung was collapsed and the peritoneal cavity was distended seriously embarrassing respiration; the patient dying six hours later.

This is our only death in this series, that can be considered an anesthetic death, and I believe that it is a fair average of fatalities and complications during each year of the five years and a half that I have had charge of the anesthetic department.

My personal work during this time comprises by a conservative estimate of over 4500 general anesthetics, and my only complications are one case of hemorrhagic pneumonia developing ten or twelve days after tonsillectomy, doubtless from a latent tubercular condition, though he was robust, weighing about 185—died 16 days after operation.

One case of large cerebral tumor as shown by autopsy, and two mild cases of pleurisy both of which recovered in a few days.

Contrasting this with the record of postoperative pneumonias of Mt. Sinai Hospital following both local and general anesthetics reported in *A. M. A. Journal,* February 2, 1924 of from 2 to 15 per cent it would seem that the difference in the incidence of these complications must be accounted for by climatic and other environment, since they have the best of equipment and use only trained anesthetists. Texas people have the advantage of the open air the year around, and an air to respire without fog, smoke and contaminated dust.

Conclusions

1. That nitrous oxid, ethylene and ether are approximately equally safe and with them and their various combinations we can meet the needs of general anesthesia efficiently and safely.

2. That nitrous oxid-oxygen for pleasant induction with ether sequence, can with due care be made a safe and free from postoperative dangers and discomforts as from either of the gases and oxygen alone.

3. That the less complex the gas-oxygen apparatus the earlier the student will master the technic of administration and ultimately become more adept in their use for the greater benefit of the public.

4. Nitrous oxid is used principally in our obstetrical department for analgesia. Ethylene effects the muscular action of the uterus too much and patients are often drowsy or labor is delayed when ethylene is used early. Ethylene is often used in obstetrical operations, especially for Cesarean section, and during the stage of expulsion. Ether is often added in the same way. The use of chloroform has been almost discontinued.

4307 Junius St.

LOCAL ANESTHESIA IN NEUROLOGICAL SURGERY*

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During the past five years I have used, as a routine, local anesthesia in various operations on the central and peripheral nervous system. My first experience with such an application of local anesthesia was as chief of a neuro-surgical team during the St. Mihel and Argonne offensives, in 1918. At this time a satisfactory technic for the operative treatment of brain injuries had been developed by Cushing—a technic which was responsible for the reduction of the operative mortality from 60 to 65 percent to less than 30 percent in head injuries with dural penetration. One of the most important features of this technic was the use of local anesthesia. After returning to civil life I could see no reason why the method could not be equally as successfully used in operations for the various neuro-surgical conditions encountered in civil practice.

Selective Anesthesia

Although local anesthesia has been thus employed as routine, there are certain exceptions where the use of general anesthesia is the method of choice. Children as a class and adults whose thorough cooperation can not be relied upon had best be given a general anesthetic, unless sufficient preliminary hypodermic medication can be safely administered as to render them indifferent to the discomfort of lying in certain positions necessary for the operation to be performed. The nervous temperment of the operator is another important factor to be considered. I am personally acquainted with many most excellent neurological surgeons, for example, who can not do their best work if worried by the patient's request for change of position, a drink of water, etc. Under such circumstances, their work can be best done with the patient completely anesthetized.

Peculiar Advantages

Of all the various neuro-surgical procedures, in operations on the brain local anesthesia has peculiar advantages. After a thorough infiltration with a procain-epinephrin solution the skull can be entered

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painlessly, and for ordinary incisions and manipulations the dura seems to be free from sensitivity. Accompanying the middle meningeal artery is a small branch of the fifth cranial nerve which causes a certain amount of pain when the artery is divided in reflecting upward a dural flap. This pain can be prevented by injecting this small nerve, using a very small hypodermic needle, before the dura is incised. Occasionally, there may occur a moderate amount of pain when the bone flap is broken down; this is especially true when the dura is rather abnormally adherent to the inner surface of the skull. It is well known that the brain itself is devoid of painful sensations; after a painless opening has been made, therefore, all necessary intracranial manipulation can be done without conscious perception on the part of the patient.

In spite of the numerous methods advised for the control of scalp hemorrhage, this is frequently a most troublesome and at times a dangerous factor in brain operations under general anesthesia. The entire cranial circulation is greatly congested, which gives trouble not only in the scalp but also within the skull, where frequently there will be a persistent oozing from even the smallest vessels, the eventual control of which requires the most painstaking and time-consuming attention. With the use of local anesthesia, the epinephrin proves an effective hemostatic, so that very few clamps are required. Furthermore, instead of the tremendous congestion giving rise to troublesome hemorrhage most difficult to control, the brain circulation is normal, and such bleeding as might occur is easily and quickly controlled with little or no tendency to post-operative oozing.

The average extensive brain operation under general anesthesia is usually productive of more or less shock. The prolonged anesthesia and the loss of blood are perhaps the greatest factors in producing shock. The anesthesia is usually prolonged because of the great trouble in controlling the hemorrhage. Eliminate the one and you thereby eliminate the other. Under local anesthesia the patient rarely if ever shows evidence of shock. The usual experience is to have the patient leave the table with the blood pressure and the pulse practically the same as before the operation, a state of affairs, which in my experience at least, is seldom the case where general anesthesia has been employed.

Taking everything into consideration and basing the opinion on a fairly extensive experience in major brain surgery with general and local anesthesia, I am thoroughly convinced that the margin of safety is greatly broadened when the latter method is used. Many patients have greatly increased intracranial pressure and are exhausted from frequent vomiting and lack of nourishment, and are therefore poor operative risks even from minor surgical procedures, to say nothing of prolonged operations so frequently necessary to the proper handling of the patient's condition. Any method, therefore, which will materially enhance the chances of withstanding the operation is certainly worthy of serious consideration.

Spinal Cord Operations

Although local anesthesia can be successfully used in operations on the spinal cord and peripheral nerves, the advantages over general anesthesia are not so pronounced as in the case of intracranial operations. The choice of anesthesia in such cases depends largely upon the preference of the operator. Should local anesthesia be used in operations on the spinal cord I feel it should be combined with gas-oxygen or ether anesthesia after the spinal cord has been exposed. After exposure of the cord a pledget of cotton soaked with a procain solution can be laid on the cord above the area to be manipulated, thereby producing a very satisfactory anesthesia of the cord. As all cord manipulations, however, are very painful and shock-producing a general anesthesia during this stage of the procedure is to be preferred.

In operations on the peripheral nerves, local anesthesia can be most satisfactorily used. In my own work I prefer the infiltration method for the exposure of the nerve. After this is accomplished the nerve can be anesthetized by injecting the solution within the nerve sheath. In making such injections one should be careful not to injure the artery within the nerve, as otherwise a hematoma with subsequent fibrosis will be produced. After a thorough nerve injection has been made, the lesion below the injected area can be dealt with without causing either shock or discomfort.

Solution and Methods

In all neuro-surgical operations in which we use local anesthesia we prefer a one percent solution of procain to each ounce of which has been added five minims of epinephrin (adrenalin) chlorid solution (1:1000). This solution is best made up immediately before each operation. For the sake of convenience the powdered procain may be kept in capsules, each capsule containing five grains of the drug. The contents of two such capsules added to two ounces of boiling water, plus the addition of ten minims of epinephrin solution, will give a sterile one percent procain-epinephrin solution of sufficient quantity for the average operation.

In extensive operations, however, I have used as much as six ounces of such a solution and have never noted any toxic effects from the drug. On one occasion (I may say, in passing), in the case of a cerebellar tumor, there was a marked epinephrin reaction characterized by a sudden rise of blood pressure to 180 systolic, and a pulse of 180 per minute; sudden loss of consciousness followed

by a generalized convulsion; balanced extremities, etc. This case was reported in *The Journal of the American Medical Association*, April 14, 1923. The operation was deferred to a later date, when the patient was given a general anesthetic.

But to return to the technic, blood pressure readings are taken every five minutes from the time the patient is put on the operating table. It has been noted that soon after the infiltration is made there is usually an increase of the systolic blood pressure from ten to thirty points. This, however, is very transient and does not seem to cause any particular discomfort. The rise is probably due to the epinephrin used in the solution. We use as routine a massive infiltration along the line of the proposed incision. In the case of cranial operations the scalp can not be successfully injected. The infiltration is made by a long needle and Luer syringe of at least 20 c.c. capacity, the point of the needle extending just through the scalp above the galea. As the infiltration progresses, the scalp is raised by the underlying fluid and the needle can be further inserted during the injection along the line of the proposed incision. The infiltration is now extended under the galea and into the muscles in those regions in which muscle is present. If sufficient solution is used and at least fifteen minutes allowed to elapse before the incision is made, the patient does not complain of any pain whatsoever. As a rule no further use of solution is necessary, provided the initial infiltration has been massive enough. The objection might be raised that such an infiltration anesthesia along the line of the incision will prevent proper healing of the wound. I do not believe that this objection can be sustained by experience, as I have never had any trouble whatsoever in the proper healing of wounds after such infiltration.

During the past year, in the case of adults, the following preliminary treatment has been used. *On the night preceding the operation the patient receives chloretone, grs. 5 to 10 by mouth. This is repeated two hours before the operation. One hour and twenty minutes before the operation the patient is given (hypodermically) pantopon, grs. 1/6, scopolamin, grs. 1/300, 25 percent magnesium sulphate, 2 c.c.; twenty minutes later this is repeated except that the dose of scopolamin is reduced to grains 1/400 instead of 1/300. Twenty minutes later if the patient does not seem to be drowsy an injection of pantopon, grs. 1/6 in 2 c.c. of 25 percent magnesium sulphate is given. By using this preliminary medication the patients as a rule can be carried through extensive operations without any of the disturbing mental worry which is sometimes present when no such preliminary medication has been used. As a matter of fact the patient is frequently surprised to learn on the day following that the operation had already been performed. Such a combination of preliminary medication and local anesthesia might be termed a pseudo "twilight sleep" procedure. It is not essential in the least to give such preliminary treatment in order to perform these operations successfully under local anesthesia. We are of the opinion, however, that the combination has many advantages. In cases with enormous increase of intracranial pressure the above preliminary medication is not given, as I have felt that it might perhaps be unwise to administer opium under such circumstances, on account of the fact that the medullary centers may already be more or less embarrassed by the increased pressure. Such patient, therefore, have been given sodium bromid, 20 grains, four times daily for several days preceding the operation. After the operation has been begun and the intracranial pressure has been relieved, small doses of morphin are sometimes given on the table when the patients become restless. In the case of spinal cord and peripheral nerve operations there is no objection to the routine use of preliminary preparation as above outlined.

*This preliminary medication is that used by Dr. T. J. Collier, Anesthetist to the Piedmont Hospital, Atlanta, Ga., in adults receiving a general anesthetic.

CONCLUSION

In conclusion I wish to state that in my experience the use of local anesthesia in extensive brain operations seems to allow a broader margin of safety than that offered by the use of general anesthesia. As to the use of this method in other neuro-surgical operations I see no particular advantage over the use of general anesthesia where the latter is not distinctly contraindicated. Such operations, however, can be successfully performed under local anesthesia with perhaps the exception of laminectomy where considerable manipulation of the spinal cord is necessary. In operations of this type a general anesthesia is to be preferred, or if the operator so desires, the exposure of the spinal cord can be done under local anesthesia and a general anesthetic given only during the stage of the operation where manipulation of the cord is necessary.

LOCAL ANESTHESIA IN KIDNEY SURGERY.*

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NEW ORLEANS, LA.

In the presentation of this subject I will omit unessential details and will emphazise those points which experience has proved of advantage.

PEROPERATIVE ATTENTION

The patient, having been given the usual preoperative attention and ¼ grain of morphin by hypodermic, is placed on the table in the kidney position, lying across a small, soft pillow placed

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under the opposite lumbar region. I have found this sufficient to properly present the operative field. If the table is broken or a kidney bridge raised it should not be done until later in the operation when the kidney is delivered into the wound as this position if maintained too long may become a cause of complaint.

The incision under local should be somewhat larger than that required under a general anesthesia and I always plan to divide the last rib, though this is occasionally omitted.

Technic

A methodical plan of procedure greatly simplifies the technic and is as follows:—a long needle is entered about the center of the proposed incision and the tissues injected in a fan like manner from the skin down to the quadratus lumborum muscle by successive thrusts of the needle from the ribs above down to near the crest of the ilium below. In the upper part of the field the 11th and 12th dorsal nerves are both injected.

At the site of the incision the 12th nerve will be found one inch below the rib and level with its anterior surface while the 11th nerve lies just below the under surface of its rib.

Having anesthetized the superficial parts the needle is then passed through the quadratus lumborum muscle at several points along its proposed line of exposure, anesthetizing it and advancing into the cellular tissue in front.

The incision is then carried down to the outer edge of the quadratus muscle and the 12th dorsal nerve sought for. It will be found running downward and outward on the anterior surface of this muscle which it leaves about the center of the field to continue its course between the transversalis and internal oblique. It may be given an additional injection if found necessary and retracted to the posterior side of the wound. The abdominal muscles having been separated from the quadratus the cellular tissue in front is entered and additional injections made. The finger is now passed inward in front of the quadratus until the vertebral column is reached just in front of the psoas muscle. Four or five injections of about 5 c.c. each are now made up and down the vertebral column and quite close to it with a view of reaching the rami communicantes from the lumbar nerves to the sympathetic chain, which lies close against the vertebrae. It is only through these communicating branches that sensation reaches the abdominal organs.

Exposure and Operation

Having done this satisfactorily the kidney is exposed and operated upon without complaint. Occasionally with very large kidneys, hydronephrosis or pyonephrosis, they must be reduced by aspiration to permit of satisfactory manipulation to carry out the injections and where this can not be done the injections can be made above, below or in front of the kidney.

At times the situation is complicated by a perinephritic abscess and the whole region bound down by a mass of infiltration. In such cases after the abscess has been evacuated if the kidney is to be removed it can be anesthetized by advancing along its capsule, either in front or behind, toward the hilum where a fairly liberal injection of 5 to 10 c.c. will anesthetize the entire organ.

If the kidney is very large and badly bound down in all directions I approach the hilum by an accessible route and after anesthetizing it apply a suitable clamp, bisect the kidney shell it out from its adhesions and remove it by halves. This greatly simplifies what would otherwise be a rather difficult undertaking. The stump is then caught by forceps and the vessels dissected out and suitably ligated.

This method of anesthesia, by direct injection, as outlined above, is simpler, quicker and more certain of satisfactory anesthesia than the paravertebral method, which I rarely use.

LOCAL ANESTHESIA FOR MASTOID OPERATIONS.*

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I wish to congratulate you on your organization—The Southern Association of Anesthetists—for I believe it means a great deal to suffering humanity. I also desire to thank you for the invitation to read my paper on "Local Anesthesia for Mastoid Operations." In 1919 at Waco, Texas, during the session of the State Medical meeting, I presented this subject to some one hundred otologists, and out of that number I had only one favorable comment. I trust today I will fare better in the hands of trained anesthetists. If my simple effort in bringing this subject to your attention can change the method of anesthesia in those cases that are suited to local anesthesia I believe my time and work will be well spent.

I realize, and you gentlemen should know, that in a simple mastoid in the adult patient, blocking with procain or novocain can be done thoroughly. If, in this day and time, many men are infiltrating larger areas and looser tissues successfully, why can not tissue over flat bone be infiltrated and nerves blocked easier? For this is the kind of tissue we have in blocking and infiltrating in mastoid operations. For pain in superficial or local, and in middle ear and drum membrane drainage my choice of anesthetic is one per cent novocain injected subcutaneously in all directions in and around the mastoid region, well around the tip, down the sides of the

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canal and above over the zygomatic ridge. My choice of anesthesia for opening the drum membrane for thorough drainage in conjunction with local mastoid work is cocain and carbolic acid or anesthesia put in ampules by the Physicians' Supply Company of Philadelphia.

METHOD USED

I do not expect to give you gentlemen the details of the complete mastoid operation, as this society is only interested in the way mastoid work can be done without general anesthesia and painlessly to the patient. My method embraces:

First.—The patient. Adult, if he requests it or those cases in which general anesthesia is contraindicated.

Second.—To quiet the patient with ¼ grain morphin one-half hour before the operation. Preparation of patient is the same as for general anesthesia. Insist of all nurses and assistants maintaining absolute quiet in the operating room during the entire time of operation. Assuming everything is in readiness for nerve blocking, I use a 20 c.c. Luer syringe and a three inch needle of moderate size. A sterile 1 or 2 per cent solution of novocain is injected, beginning at the tip of the mastoid and following the curve of the ear upward; then down the sides of the canal; back around the entire mastoid region, keeping in mind the infiltration and blocking of nerve filaments of the auricularis magnus and occipitalis minor, using 15 or 20 c.c. of this solution.

After the usual curved incision well up to the zygomatic ridge and above, if the previous *x*-ray shows cells in this region, the muscle at the tip should be well dissected away so as to expose this part. The next step I consider one of the most important in this operation, from the local operator's standpoint, is the way and method of opening the mastoid. The average operator will use chisel and hammer, but under local this is quite shocking to the patient, so I prefer to use rongeur forceps, beginning with the tip, which in many cases has a large cell. This biting method is not nearly so unpleasant a sound as chisel and hammer. Using rongeur forceps to open the entire cortex, I clean out the cells with curette and hand burrs. As the antrum is opened, this region is anesthetized with a few drops of fresh 10 per cent cocain solution, which in five or ten minutes will allow of gentle curetting of granulations in the antrum. The drum is opened at this time as outlined in the beginning of this paper, if it has not been done before. The debris is gently washed through with sterile boracic acid solution.

I finish my local cases with blood clot closure and drain, stitching up the wound to tip with rubber tissue for drainage. This method I have used on fifteen cases in the army, and ten cases since in private practice. Some of these cases had fistulas in the neck below the tip of mastoid, several with lateral sinus and dura exposed when the mastoid was opened. I have not had a single bad result in the twenty-five cases.

CONCLUSION

(1) I had perfect anesthesia without prolonged operation.

(2) The dangers of general anesthesia were eliminated.

(3) Pain after operation was less than with general anesthesia.

(4) There was no nausea or disturbance of patient after operation.

(5) The oldest patient was sixty-five and the youngest twenty-two years of age.

KRESS BLDG.

CESAREAN SECTION UNDER LOCAL ANESTHESIA.*

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SALINA, KANSAS

On July 17, 1919, I did my first Cesarean section under local anesthesia and reported the case together with two others in a paper upon this subject read before the Kansas State Medical Society, May, 1920. At that time local anesthesia was being extensively used in major surgery but for some reason had not gained prominent recognization in its application to this particular operation. My remarks at that time occasioned some very austere criticism and left doubt in the minds of many as to its possibility and, especially, its practicability, while a few accepted it.

Shortly following this I received many inquiries and requests for reprints of the article which was evidence of the interest of the profession at large in the procedure. This together with the satisfactory results in my few cases stimulated me to expand its application, until at present a large percent of my Cesarean sections are done by this method. I do not recommend or attempt its use as a routine procedure but I do feel that the proper knowledge of its technic and possibilities together with wisdom in its application will soon gain for it the standing it deserves with a further reduction in the mortality for both mother and child.

ADVANTAGES

The dangers, complications and sequelae which attend the administration of any general anesthetic are eliminated. A brief statement of a few of the most prominent advantages of the use of local anesthesia is worth while:

1. It is the safest method for both mother and child.

2. It is simple to do and can be used in the cases and circumstances which forbid the use of a general

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anesthetic. Such as: Exhaustion—especially from unsuccessful efforts at delivery and from hemorrhage. Cardiac and kidney complications. Systemic complications from exophthalmic goiter, tuberculosis, diabetes and acidosis, as well as the emergency arising in eclampsia and placenta previa.

3. Shock is absolutely prevented.

4. Postoperative nausea and vomiting are reduced to a minimum and usually do not occur. The abdominal muscles being quiet there is less strain on the incision. The mother is comfortable and the postoperative administrations of opiates is seldom necessary which in itself is a valuable item.

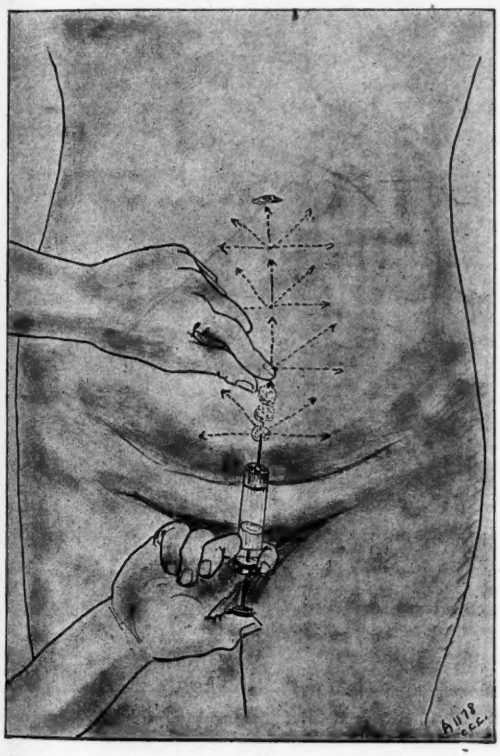

Fig. 1. Outlines of anesthetic fields.

5. The danger of postoperative pneumonia is greatly reduced.

6. Distension and paralytic ileus, very common sequelae of general anesthesia, are practically eliminated.

7. The additional strain on the patient's resistance which accompanies the administration of a general anesthetic, renders her more susceptible to the effects of any infection which may have been induced during or preceding the operation.

Technic

The technic employed is of the simplest type and can be successfully carried out by any surgeon of ordinary skill. I have always employed the transperitoneal route as it is simpler and more applicable when using local anesthesia. Time permitting, the operation is done by preference on a selected date. The patient is then given the advantage of preoperative preparation as for any other major operation. We do not administer a purgative to our Cesarean cases but prefer to empty the lower bowel with an enema one hour before operation. Food is restricted only on the morning of operation and the patient is encouraged to take water freely up to an hour preceding operation. The bladder is emptied by catheterization just before the patient is taken to the operating room.

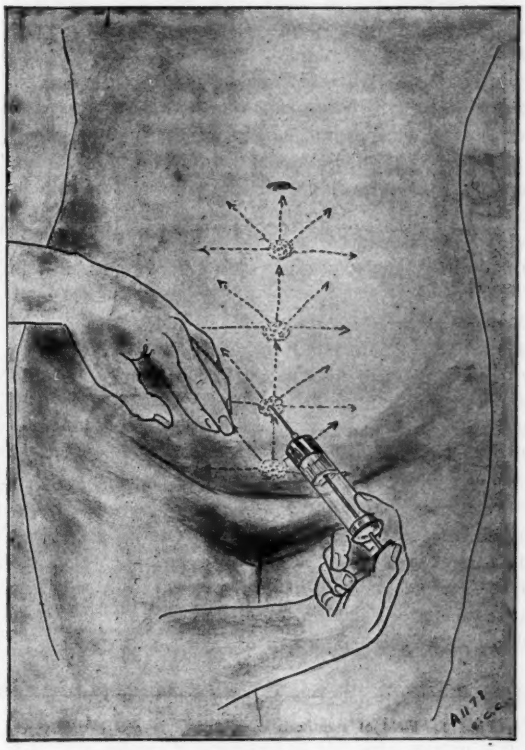

Fig. 2. Method of injecting subcuticular tissue.

Morphin 1-6 gr. and scopolamin 1-200 gr. are administered hypodermically one hour before operation. Scopolamin in 1-300 gr. doses is repeated once or twice as may be required to produce drowsiness but no more morphin is given. In those cases that enter the hospital for immediate operation, morphin 1-4 gr. scopolamin 1-100 gr. are given without repeating either drug.

About four oz. of a 0.5 per cent novocain solution are used. Infiltrating the line of incision and surrounding field of operation. Infiltration is preferable to nerve blocking as we are not endeavoring to produce muscular relaxation of the abdominal muscles as is required in other abdominal opera-

tions. The site of puncture is picked up between the thumb and index finger and the first wheal made, through this the needle is introduced into the subcutaneous tissue. Fanwise injections are made surrounding the puncture into the subcuticular tissue. The procedure is repeated until the desired field is anesthetized.

The skin and subcutaneous tissue is now incised down to the fascia. All hemorrhage is controlled as it obscures the field and interferes with proper injection beneath the fascia. The fascia is anes-

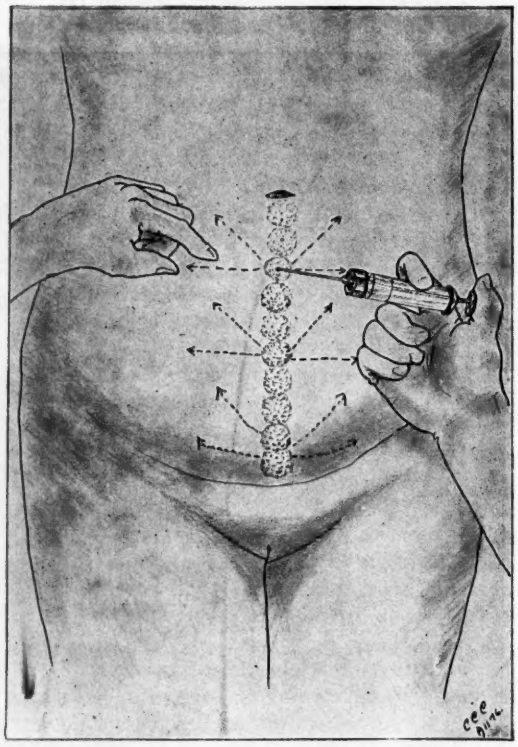

Fig. 3. Field of anesthesia completed.

thetized by carrying the needle to the outer border of each rectus muscle throughout the length of the incision; no further injections are necessary.

DELIVERY AND CLOSURE

The peritoneum is incised without pain unless traction is made upon it; in which event severe pain is produced. As the uterus is not sensitive to the incision it is now delivered and incised; or the incision and delivery of the child may be made while the uterus is in the abdominal cavity, depending upon which procedure the operator may choose. To deliver the uterus, before incising and delivering the child, requires a longer incision and occasions some pain and, if fear of infection is not present, it is not necessary, as the escape of some amniotic fluid into the peritoneal cavity is not hazardous.

The care of the child and toilet of the field are attended to in the usual manner, careful attention being directed to the extraction of all of the placenta and membranes because if any should remain they at least cause discomfort to the patient by stimulating uterine contractions and may cause alarming hemorrhage with secondary rising temperature the result of saprogenic infection. The assistant introduces the index finger into the upper angle of the uterine incision thereby making harmless traction which effectively controls hemorrhage and permits

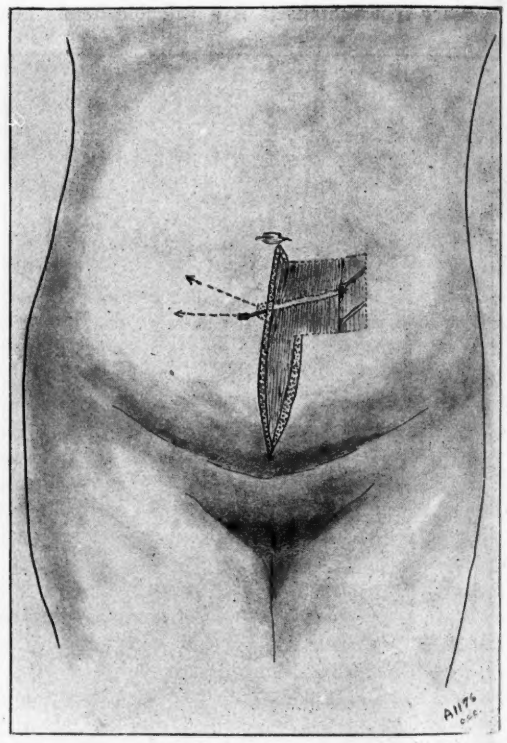

Fig. 4. Section removed showing how needle is directed to the outer border of rectus muscle to reach nerves.

a rapid and accurate closure of the uterine incision, which insures against secondary hemorrhage. The uterus is closed by continuous suture of the uterine peritoneum. The abdominal wall is closed in layers by continuous sutures and a few interrupted tension sutures. The skin is closed by interrupted silk worm gut sutures threaded through small bits of rubber tubing to prevent them from cutting the skin; the edges of the skin are brought together by interrupted horse hair sutures.

PRECAUTIONS

Care should be exercised in making the skin incision as the resistance offered by the infiltration may lead to beveling the skin which makes proper coaptation difficult and in susceptible individuals may

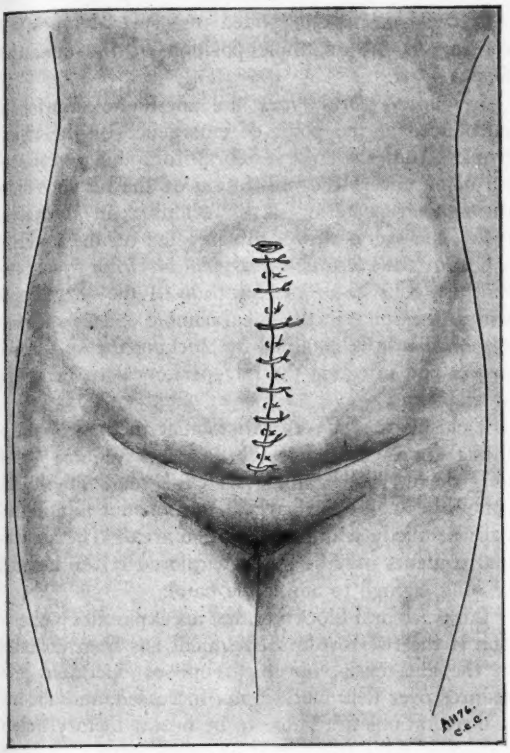

Fig. 5. Closure of skin and subcuticular tissue by interrupted tension sutures of silkworm gut threaded through small rubber tubing, and coaptation sutures of horse hair placed between the tension sutures.

predispose to the formation of keloids. Before closing the abdomen any hemorrhage in the abdominal wall should be controlled since troublesome bleeding may follow absorption of the anesthetic and result in hematoma with increased liability to infection and delayed union. The uterine incision should be in the middle line. If the surgeon fails to use due caution he may be deceived by uterine rotation, place the incision to one side and encounter large vessels. Manual compression of the uterus or broad ligaments to control hemorrhage is not only unnecessary but is hazardous as it may lead to traumatic thrombosis of the vessels. The injection of ergot or pituatrin is time consuming and certainly increases the possibility of secondary hemorrhage.

The whole procedure must be attended with the utmost respect and kindness to the patient and her tissues and is successful in proportion to the details paid these requirements. Mad efforts for speedy delivery have no place in the operation.

Suite 402, National Bank of America

Make your plans now to attend either the meeting of the Eastern Anesthetists, Hotel Adelphia, Philadelphia, October, 26-29; or the Southern Anesthetists, Jefferson Hotel, Dallas, Texas, November 10-11.

LOCAL ANESTHESIA IN SURGERY OF THE ABDOMEN.*

Charles F. Nassau, M.D., L.L.D., F.A.C.S.,
Philadelphia, Pa.

Since the inception of local anesthesia, its use has occasioned a large amount of discussion and much unfavorable criticism. This latter was due in part to the fact that many men who attempted to operate by this method had given too little consideration to the technic of administration, and had neither the anatomic knowledge nor the surgical skill which is required in local work.

Selective Anesthesia.

Within the past five years, the technic has been much improved, and it is now conceded by men who have persisted in operating under local that in order to succeed in this variety of work it is necessary to have experience. Unfortunately this can be obtained only at the operating table, and it is years usually before completely satisfactory results, both as to anesthetization and operative success, can be obtained. In minor operations which are done under direct infiltration or field block the procedure is easy; it is in major work that the experience of years is invaluable.

Labat says that the beginner is not to be expected to be successful with his first attempt; partial failure can be remedied by the administration of a few whiffs of ether or gas. In fact, many operations in certain conditions are performed best with the combined method of anesthesia. For instance, if the surgeon starts to remove an appendix in a young woman who has thick firm abdominal walls, and then finds that he is confronted by a deep-seated broad ligament cyst, it would be a mistake as a rule to continue the operation under local anesthesia. The incision required is too large when one considers the ease with which the average pelvic cyst can be lifted up under general anesthesia.

While I do not believe that local anesthesia is the best type for administration to all surgical patients it is now generally accepted as the only way in which certain kinds of cases should be submitted to operation. In strangulated hernias, particularly in those patients past sixty years of age, local anesthesia is not merely a method of choice; its use is clearly indicated. By this method, the mortality from operation is lessened so materially as to be almost negligible. In fact, all aged patients are given an infinitely greater chance for prolongation of life when operated upon under a local anesthetic.

Local is undoubtedly the best method of anesthesia in operation upon all head injuries, where the addition of a general anesthetic, with the consequent congestion of the veins in the pia-arachnoid may result in an increased mortality.

*Read during the First Annual Meeting of the Eastern Society of Anesthetists, Hotel McAlpin, New York City, October 20-24, 1924.

Patients who are suffering from organic diseases, such as tuberculosis, diabetes, chronic kidney and chronic heart conditions are subjected to a definite amount of risk when operation becomes necessary; this risk is undoubtedly minimized by the use of local anesthesia. When operated upon in this manner, these patients are relieved of damaging effects upon kidneys, heart, lungs, liver and the changes in the blood which follow the use of a general anesthetic.

SPECIAL BENEFITS

To patients who have strong objections of losing consciousness, the idea that they may choose to be operated upon without doing so is often the deciding factor. Patients who are in moderate financial circumstances and who are suffering from minor ailments, such as moles, warts, cysts, lipomas, etc., may be operated upon in the surgeon's office, thus obviating the charge for hospital care; or they may be operated upon in the hospital for such conditions as ganglion, neurofibromata, etc., and go home immediately afterward, having been put to no expense other than that for the use of the operating room.

Patients who are operated upon under local anesthesia suffer much less from nausea and vomiting and as a rule are absolutely free from these unpleasant sequelae of general anesthesia. With this postoperative comfort they are able to take liquids immediately after operation. In fact, a large number of the patients operated upon in this way begin to lead normal lives as soon as operation is complete.

Shock is frequently eliminated in major operations by the use of local anesthesia. In an experience of over twenty-five years in local anesthesia work, which covers practically every variety of operation, I have never lost a patient from postoperative pulmonary complications, and I believe this to be the experience of many other surgeons. I am unable to make the same statement in regard to general anesthesia.

METHODS OF USE

The manner in which a local anesthetic is administered depends entirely upon the location of the field of operation:

(1) Direct local infiltration is practical for many slight conditions.

(2) Field block is used for minor operations and in combination with other types of infiltration for many major operations, the operative field being surrounded by a wall of anesthesia.

(3) In nerve block the fluid is injected directly into the nerve or into tissues in close proximity. Nerves are not injured by direct injection, but for anatomic reasons it is sometimes impossible to directly infiltrate a nerve, and it is unnecessary, inasmuch as extraneural and perineural anesthesia produce the same effect.

Nerve block is subdivided into several types, according to the anatomic position of the operative field:

In *paravertebral block* the anesthetic solution is introduced at the point of emergence of the nerve trunks from the intervertebral foramina; *transsacral block* covers the infiltration of the nerve trunks through the posterior sacral foramina; in *parasacral block,* the sacral nerves are injected on the anterior aspect of the sacrum; *intraspinal block,* or *spinal anesthesia,* consists of the injection of the nerve roots within the spine in the subarachnoid space; *splanchnic anesthesia* is obtained by blocking the splanchnic nerves and injecting the retroperitoneal tissue at the solar plexus.

Field block is a very satisfactory method of anesthesia for laparotomy. It does not require either long or intricate training, is easily and quietly accomplished, and the parietal peritoneum is anesthetized perfectly within the blocked area. The abdominal contents may be gently explored if the incision be long enough to admit the hand.

Paravertebral block permits an exploratory operation if the twelfth dorsal segment has been included in the anesthesia, but the scope of operative procedures over field block is not increased, and abdominal operations are liable to be unsatisfactory unless combined with splanchnic or some form of general anesthesia. Transacral block is employed successfully in pelvic work, and parasacral block in perineal and rectal operations.

Spinal anesthesia may be valuable in certain cases but it has so many detrimental features that personally I feel that its use is seldom indicated. It is one of the least desirable methods, being accompanied by a greater element of danger.

Splanchnic anesthesia requires experience and skill in its use, but has distinct advantages over paravertebral block. It may be introduced by either the anterior or posterior route. Several methods are used. The posterior method, while it may be advantageous in certain cases, has a dangerous objection. Splanchnic ganglia are situated close to the cava and other large blood vessels. In introducing the needle, puncture of these vessels is liable to ensue and if solution be thus introduced into the vessels, the outcome may prove fatal.

I myself prefer the anterior method described by Braun. In this way injection of the splanchnic area is made under the control of the eye and finger. The anterior method requires a laparotomy. The abdominal wall is anesthetized by injecting the solution along the costal margin and the lateral borders of the recti muscles. A midline incision is made, and after retracting upward the left lobe of the liver, the stomach is pushed toward the left, and the hand is passed into the abdominal cavity. Medially to the

lesser curvature of the stomach the forefinger makes contact with the anterior surface of the first lumbar vertebra. The pulsating aorta is slightly retracted laterally by the finger, thereby disclosing a portion of the anterior aspect of the vertebra. A large needle (No. 5) is then introduced in close contact with the bone and 50 c.c. of 0.5 per cent. novocain-suprarenin solution are injected without displacing the needle. In like manner, the right lateral part of the anterior surface of the body of the vertebra is defined and the needle is reintroduced, always keeping in close contact with the side of the body of the vertebra, and 50 c.c. of the same solution again injected.

Solutions

Solutions for the induction of local anesthesia must be fresh and of accurate strength. At the present time novocain appears to produce the most satisfactory results with the least danger. I have used it for a number of years, in the strength of 0.5 per cent. and have had unvarying success as to anesthesia and a minimum postoperative toxemia, even when using as large a quantity as eight ounces of solution.

In operations in areas which are supplied by terminal vessels and in toxic goiters this solution is used alone. In all other procedures, five minims of a 1:1000 solution of adrenalin chlorid are added to each of the first three ounces of the anesthetic. Either the "A" tablets of novocain and suprarenin or sterile ampules of adrenalin chlorid may be utilized. The addition of the adrenalin chlorid prolongs the anesthesia but has no apparent effect upon toxicity.

Toxic effects of novocain may be manifested in nausea, vomiting, cardiac palpitation, dizziness and cold clammy sweat. Reabsorption of the novocain is the cause of such toxicity and is usually cerebral in origin. Occasionally persistent nausea and vomiting occur. If fresh air and cold cloths applied to the forehead do not relieve the condition, a few whiffs of ether, carried on to complete narcosis if necessary, are indicated. In this strength, however, I have never seen any alarming symptoms develop.

Narcotics

The routine administration of narcotic drugs in connection with local anesthesia should be avoided. In operations for the radical cure of hernia they are very seldom needed, but in nervous individuals and in operative procedures where one is almost sure to cause some pain, the combination of morphin and scopolamin may be administered one and two hours before operation. The use of narcotics preliminary to local anesthesia is not altogether free from danger. Mayer, in the report of the Therapeutic Research Committee, states that morphin and scopolamin increase the danger from chloroform and ether; and since the latter are synergistic with local anesthetics it seems probable that morphin and scopolamin are also synergistic with the local anesthetic in their action on the respiratory center. Morphin should be used with caution, never in large doses or in repeated small doses.

Surgical Requisites

In order to operate successfully by this method, it is essential that the surgeon shall have a definite knowledge of descriptive and topographic anatomy, with special reference to the distribution of nerves, and a considerable degree of information in regard to human nature. The operator under this form of anesthesia must be so confident of his ability to carry it through successfully that the patient will be more or less automatically permeated by the same belief. His manner must be calm and he should begin infiltration quietly and continue it with precision.

It seems best that the surgeon should administer the anesthetic himself, for the reason that in most cases the solution has to be introduced at successive stages of the operation and he alone is in a position to know the proper amount to be introduced and the areas to be anesthetized.

As stated before, perfection of technic is essential for the successful administration of local anesthesia. Complete and careful sterilization of the entire local anesthesia instrumentarium is imperative in order to eliminate toxic effects from the anesthetic solution. It is important to have adequate instruments at hand for the various procedures. The operating room personnel should be treated in the technic of local work; assistants and nurses should be familiar with instruments and solutions, and the atmosphere must be free from both noise and confusion.

The few instruments necessary for inducing local anesthesia comprise a 10 c.c. syringe with a set of needles of proper length and caliber; small enamel cups are useful to hold the solution. Administration is by means of a needle properly selected as to size and length, combined with any good syringe, either a Record, Labat or Meeker. Wherever the skin is to be punctured a wheal should be raised before introducing the solution. The needle should be introduced through the wheal at right angles to the skin surface. Infiltration must be carefully and painstakingly made without extreme pressure. As the needle is pushed forward, the tissue should be infiltrated and injected by a steady and continuous introduction of the fluid. To change the direction of the needle, its point must be withdrawn. When working in the region of blood vessels it is well to aspirate so as to make sure that the point of the needle is not in the lumen of important blood vessels. When anesthesia is considered complete the operative field should be tested with the point of a needle. If any part of the field is still sensitive to pain, this area

should be blocked by the injection of more fluid.

The surgeon must be sure to have thorough intraperitoneal anesthesia when working in the abdominal cavity. He must obtain wide exposure, use sharp dissection and handle peritoneum and viscera with the utmost gentleness. The importance of overlapping in the peripheral innervation of somatic segments needs always to be borne in mind while operating.

CONCLUSIONS

The wound healing which follows operation under local anesthesia is in every way equal to the healing of incisions made under inhalation anesthesia.

Convalescence is particularly smooth. In the frequent absence of nausea, vomiting and abdominal distention, the patient usually makes an easy and uneventful recovery, and it has been my experience that postoperative pneumonias are much less severe and more uncommon in patients who are operated upon under local anesthesia and those explored under ether.

The number and variety of operations performed under local anesthesia have been greatly augmented during the past few years and while I do not consider it to be a method which should be employed universally, I believe that many operations which are routinely performed under general anesthesia can be done well under local anesthesia with perfect comfort to the patient and with lessened danger.

To blindly compel every individual to submit to operation in this way would be, of course, a mistake and would bring discredit upon the method; but this fact should be borne in mind always by the surgeon who gives the greatest consideration to the safety of his patients: without exception, any abdominal operation can be done under local anesthesia if the exigencies of the case demand it.

1710 LOCUST STREET.

ANESTHESIA IN RETROSPECT: PRESIDENTIAL ADDRESS — CANADIAN SOCIETY OF ANESTHETISTS, 1925*

JOHN J. BUETTNER, M.D.,
SYRACUSE, N. Y.

It gives me great pleasure to stand before you and acknowledge my gratitude in having been chosen to preside over your destines for the year 1925. While the honor is at all times great to be elected President of such an august body as this, to me the honor is extraordinary, in that I am the first member from the United States to hold this office. This fact goes to prove that as far as the medical profession is concerned the dividing line between the United States and Canada is absolutely visionary. The anesthetists believe in reciprocity, because the Associated Anesthetists have chosen a Canadian to guide their destinies. Incidents of this kind give evidence of the brotherhood of man, exchange of ideas of men working along similar lines, and the promotion of Pan-Americanism.

*Read during the Fifth Annual Meeting of the Canadian Society of Anesthetists with the Ontario Medical Association, King Edward Hotel, Toronto, May 6-8, 1925.

COOPERATION

I have chosen the subject "Anesthesia in Retrospect" for my Presidential Address. There is one outstanding thought that I wish to particularly emphasize in my paper—*That is the spirit of co-operation.* Lack of it in the early days of anesthetic discoveries denied fame to some who richly deserved it and also kept anesthesia in the background. Use of it recently has given the world a most valuable anesthetic agent. Having given quite serious thought to the value of co-operation, and while pondering over its use for my address, I was interested in an article in the *New York Times* of January 4, 1925, on "Co-operation Succeeds in Railroad Car Shop." The Baltimore & Ohio railroad tried the experiment of co-operation between the management and the union workers. The answer of one of the workmen is ample proof that it was successful. When he was asked about it he answered: "Co-operation? Have we got it? Why this here plant is all broke out with it."

The same answer will always be received if all concerned in an undertaking will do their part willingly and zealously. The incident in our chosen specialty that prompted the co-operative thought was the introduction of ethylene as a routine anesthetic.

During the Third Annual Congress of Anesthetists in Chicago (1924), when Prof. Arno B. Luckhardt gave a resume on ethylene, he emphasized the fact that after he had discovered ethylene, proved its value with animal experimentation, and tested its safety upon himself and his co-workers, all his efforts would have been in vain, if his sincere enthusiasm had not been accepted and put to test by surgeons and anesthetists on human subjects in the hospital.

Fate plays many queer pranks. While Prof. Luckhardt was experimenting with ethylene in Chicago, one of Toronto's anesthetists with a scientific turn of mind was also experimenting with ethylene, and gave out his report to the world just before Prof. Luckhardt presented his findings. I refer to Dr. W. Easson Brown. The striking fact was that their findings correspond one with the other.

Another discovery that hails from Toronto interests the anesthetist very much. The discovery is insulin, the discoverer Dr. Banting. We all know what insulin has done for the diabetic who is in need of surgery. We also know the uses insulin has been put to in non-diabetic cases in acidosis.

INDEFATIGABLE RESEARCH

In retrospecting it is not my purpose to delve very deeply into the early anesthetic history, be-

cause no doubt all of you have read and reread it. It is always intensely interesting reading. We must be impressed, however, with the meagre facilities for doing research work. Dudley Buxton, in the *British Journal of Anesthesia* of January 1924, writing on "John Snow and the Advent of Chloroform," portrays very vividly the research work of Bernard, Flourens, and Snow. He comments on the limited laboratory facilities and the absence of scientific apparatus. Yet auspicious work was done by these men in establishing physiological data, that holds good today, and this in spite of their handicaps. When we read of the trials of Henry Hill Hickman, who has been called the "Forgetten Pioneer of Anesthesia," in trying to establish facts which he had proven by animal experimentation, we do not wonder that he grieved himself to death at an early age. John Snow left a heritage, of which we, as trained anesthetists, may be justly proud.

He made an intensive study of the action of both ether and chloroform, and showed the reasons for success and failure with each. *The paramount thing he emphasized was, that safety in anesthesia lay in its being administered by those skilled in its use, rather than by porters. What a pity that this dictum was cast aside and not followed up.*

While the United States is given credit for the first successful anesthetic administration, it remained for England to take the initiative in following up the scientific work and in fostering medical anesthesia. Blomfield, in his book on "Anesthetics," cites Hewitt, of England, as a zealous and indefatigable worker toward proper scientific administration of anesthetics. Hewitt is furthermore accredited with starting a new school of anesthetists in London and the larger provincial towns, and was quite insistent that applicants in medicine furnish proof of knowledge in anesthetics.

Might it not be an appropriate part of future programs of the Canadian Society of Anesthetists to have memorial addresses commemorating the lives and works of the pioneers in anesthesia? Might it not create an added incentive to the present day investigators, when they appreciate what these pioneers accomplished under great handicaps, and what could be accomplished with our present day knowledge and equipment?

When you look back into the past, and then think of what the present generation of anesthetists and scientific workers have really accomplished, does it not make you wonder why the anesthetists is still the mediocre and almost despised member of the surgical team?

And yet with it all, I look back to the formation of the New York Society of Anesthetists; also the American Association of Anesthetists, and then, under rather peculiar and as it has since proven to be most fortunate circumstances, the organization of the Inter-State Society of Anesthetists. With the formation of the latter organization, there appears on the anesthetic horizon that super-man, under whose careful guidance and vast store of knowledge a new era in anesthesia has begun. I refer to Dr. F. H. McMechan, now our Secretary General. Any one who doubts, need only look back over the anesthetic programs of that time and now, to see the progress that has been made. Pharmacologists all over this wonderful country of ours and by this I include the whole of North America, have been enthused with interest; anesthetists have accepted their research work and have co-operated most willingly with them in solving their difficulties.

It would take much more than my alloted time to tell of all the work that has been accomplished by the members of the various anesthetic societies.

Education in Anesthesia and Anesthesia Service

Anesthetic education in the medical schools is improving and increasing. I am sorry to say that the medical schools in the States do not stress anesthesia as the Canadians do. Dr. F. L. Richardson, of Boston, in his Presidential address before the Eastern Society of Anesthetists, touched upon this subject in a manner that should bring about results.

If the medical curriculum were arranged to show the inter-relationship of the various branches of medicine and their dependability one upon another, a step in the right direction would be made we have hopes. Under this method anesthesia would prosper, medical students upon leaving college would know something of anesthesia, surgical patients would be protected and anesthesia would occupy the position it should in medicine.

It was rather interesting to read the impression the American anesthetist made upon Dr. Z. Mennell of London, England, when he visited here a year ago. It makes us wonder if we are approaching our desired Utopia in the right way. Should we stop and take inventory of ourselves before we continue? Perhaps we should visit our confreres across the Atlantic in order to ascertain wherein we are lacking. At any rate it is wise to have someone point out our shortcomings, lest we think ourselves greater than we actually are.

In our retrospection let us also consider local anesthesia. We as general anesthetists welcome our brethern of local anesthesia and extend to them the hand of fellowship. We are willing to admit a place for local anesthesia, and also to admit that it has influenced general anesthesia favorably. Local anesthesia took birth and prospered in consequence of the distressing and oft fatal postoperative sequelae of general anesthesia. With greater attention now given to preoperative preparation together with the knowledge gained from the laboratory as to the causative factor of these sequelae, greater comfort and

safety are given the surgical patient.

We are willing to admit our short-comings and will continue to search for improvements until we have discovered the perfect anesthetic agent and the perfect method of using it. In this way will we immortalize the memory of those early pioneers of anesthesia, who while they apparently failed in their time, left a heritage that will never die.

106 STRATHMORE DRIVE.

THE SURGICAL, MEDICAL AND ANESTHETIC PROBLEMS OF THE TOXIC GOITER CASE WITH HEART FAILURE*

F. H. LAHEY, M.D., B. E. HAMILTON, M.D., AND L. F. SISE, M.D.
The Lahey Clinic
BOSTON, MASS.

TYPES OF PATIENTS

The cases described in this paper are a special group of *thyro-toxic* individuals who have *congestive heart failure, i. e.*—gross congestion of the pulmonary veins shown by diminished vital capacity, orthopnea—usually cough, and in some cases haemoptysis—and congestion in the systemic veins shown by enlarged liver, sometimes causing tenderness and pain; more or less demonstrable over-fulness of the neck veins, and commonly gross edema of the legs,—in many cases extending up the abdominal wall and accompanied by ascites. We have included in this group only cases that have shown this picture while actually under our observation. Thus selected the group numbers 70 individuals.

(We have had a small number of individuals with heart or heart and kidney disease, and heart failure, who coincidently had adenomatous goiter, which, so far as could be told, was not toxic. The thyroid disease bore little relation to the circulatory condition. This small group have been operated without a death. They are not included in the main group of this paper.)

About ten per cent of the thyro-toxic cases with congestive heart failure had coincident rheumatic heart disease, and undoubtedly others had a considerable degree of heart changes of the degenerative type associated with arteriosclerosis. Only one has had a clinical cardiovascular lues. They average fifty-one years of age against approximately thirty-five years for the whole toxic thyroid group. They are cases whose hearts, damaged by age or coincident disease, have failed under the stress of thyroid toxicity.

They include individuals with toxic adenomata (about one-third of the cases) and (the remainder) primary hyperthyroidism (Graves' Disease). The preoperative treatment and the problems of anesthesia are alike in both groups, save that the primary hyperthyroidism cases receive Lugol's.

Nearly all of the cases have had auricular fibrillation at the time of operation a few have had repeated transient attacks of auricular fibrillation.

They are bed-ridden, totally disabled cases; more than half of them have been disabled by their congestive heart failure for from several months to several years before coming to the clinic. Delay in resorting to surgery has chiefly been for one of three reasons:—(1) Failure to recognize the underlying toxicity because of obscurity of symptoms pointing to thyroid disease, and the evident symptoms of heart failure. (2) A reasonable feeling that such severely disabled cases could not be operated safely. (3) The natural assumption that the thyroid toxicity was only a part of the picture and that even though this could be safely removed by surgical measures, no satisfactory return to ability could be expected from the patient's cardiac condition. Our experience, which we have published, has shown us that such cases can be operated safely, and that the result as a rule is complete lasting relief of disabilty.

We know of no other situation where this problem of anesthesia and operation in the presence of congestive heart failure frequently arises,—save where failure occurs during pregnancy, and cannot be relieved by medical treatment before delivery of the patient. (Patients with angina pectoris seldom have congestive failure, at any rate during the stages when pain would suggest the possibility of surgical relief.)

PREPARATION FOR OPERATION

Each case is given a minimum of three weeks' rest in bed before operation. This is arbitrary, in a sense, but is based on clinical experience with congestive heart failure in general. Even where failure is of short duration and clears in a few hours after treatment, patients may well be rested for three weeks before given any unnecessary strain. (The only strain we have allowed these patients is that of a basal metabolism test, and this is omitted unless desired particularly.) Unpredictable sudden death, sometimes from an embolus, occasionally occurs, in congestive heart failure, particularly in the presence of auricular fibrillation. (Occasionally in general experience with cardiacs in failure such emboli have lodged in a limb and resulted in amputation, death, or both.) It is possible that emboli may be avoided in an occasional case by a rest of at least three weeks after relief of the most acute failure. It takes at least three weeks for an intra-cardiac thrombus to attach itself at all firmly to the heart wall.

Rest has been elaborated in suitable cases to include isolation, special nursing to save every possible exertion, and sedatives as indicated. A few of the patients have required venesection and oxygen administration to help them through an acute phase of their failure.

*Read during the Fourth Annual Congress of Anesthetists, the Associated Anesthetists of the United States & Canada and the International Anesthesia Research Society, in Joint Meeting, The Breakers, Atlantic City, May 25-28, 1925.

All, except four exceptional cases who did not have auricular fibrillation, have been thoroughly digitalized. After the arbitrary three weeks in bed, the individuals that have been largely relieved of their gross signs of failure (less than half the total number) have been operated at once the remaining slightly improved or unimproved cases have been treated for a longer time and the most favorable day for operation chosen,—so far as this can be told. Repeatedly we have watched such cases fail to improve and, convinced that no further gain could be expected, have operated with grave misgivings, only to have the patient tolerate the stress with ease. *Our experience has shown the importance of thorough medical care for a few weeks before operation, and the futility of prolonging this in the hope of an improvement which probably will never come.*

The Risk of Anesthesia

An important part of the risk of surgery in these cardiac cases is in the anesthesia. The risk is increased by any increase in the load which the heart has to carry.

The *increase in blood pressure* and *pulse rate* commonly occurring during anesthesia is an increase in the load which the heart has to carry. As far as it can be determined the systolic blood pressure appears to vary between 150 and 250 mm. While in general the pressure probably runs high, yet the value of its estimation in these cases is problematical because practically all of them are in auricular fibrillation. The pulse rate varies most commonly between 100 and 150. It is our experience that these cases have a somewhat slower pulse rate than do other cases of a similar degree of toxicity, possibly because of the preoperative digitalization which these cases receive. (Heart rate in thyro-toxic cases with auricular fibrillation can always be definitely lowered by proper doses of digitalis. Comparable reduction of heart rate in cases with regular rhythm cannot be obtained.) As with the blood pressure so with the pulse rate, its value is less than in cases which are not in auricular fibrillation. Its value is still less where the rate is taken at a peripheral artery. *Vigorous respiration* is but a form of muscular exercise and so throws a slight additional load on the heart.

While theoretically the conditions just considered constitute a load which the already overburdened heart might find difficulty in carrying, yet in actual practice it has carried these mechanical loads very well.

Anoxemia must be considered as a heart burden. Whether or not the ability of the myocardium may be impaired by the undernourishment of anoxemia, —anoxema is certainly a direct heart burden, in that it increases blood pressure. *Hypertension* is a definite serious heart load.

Drop in pulse rate and in *blood pressure* is sometimes seen during induction with inhalation anesthetics, particularly nitrous oxid or ethylene. This drop —even though there is no visible cyanosis—must signify a depression of circulation. Though this depression of circulation is clearly not a direct burden on the heart, in our experience it is a danger sign in poor risk thyroid patients in general and, independently of the congestive failure, the thyro-cardiac is a fragile, poor risk patient for anesthesia, and, as such, signs of circulatory depression should be avoided.

Poor general condition is of importance second only to the conditions which we have just been considering. This statement of the importance of these various conditions is based in part on our one patient who died during anesthesia. Her death was probably due to anoxemia and depressed circulation occurring during induction, and she succumbed easily because of her poor general condition. She first entered the hospital in heart failure, recovered from this, and had her superior poles ligated. She went home for eight weeks and returned to the hospital for her second operation. While failure had not recurred, she was otherwise not in as good condition as at her first operation. Her metabolism had risen, she had lost five pounds in weight, weighing but eighty-eight pounds, and she was apathetic in appearance. She came to the operating room pale, nauseated, coughing, and so restless that, contrary to our usual custom, induction was started before the preparation and draping of the operative field. Thus the attention of the anesthetist was distracted by the mechanical details of draping during the important period of induction. She became somewhat cyanosed. Oxygen was quickly and freely supplied. The breathing continued regular and of good quality for a few moments, but suddenly ceased. Artificial respiration was immediately done with pure oxygen. Respiration was resumed for a short time, but soon ceased permanently in spite of all our efforts. Final cessation of respiration occurred in slightly more than two minutes from the start of induction. This death we believe due to a too rapid induction in a thyro-cardiac in poor general condition. It emphasizes the vital importance of avoiding anoxemia absolutely in these cases, especially when the patient is in poor general condition.

The Anesthetic Agents

Theoretically, local anesthesia would seem to be the best anesthetic agent for these cases, as it puts practically no direct strain on the heart either during or after anesthesia. Therefore it was the anesthetic chosen for our first few cases of this series. We soon found, however, that these patients were not of a type for which local anesthesia was suitable. Even where the anesthesia itself was satisfactory, there was so much restlessness and nervous apprehension that the heart and respiration rates were markedly increased, and when one case showed an apparent

aggravation of the actual venous congestion of heart failure, local anesthesia was abandoned.

A trial of nitrous oxid-oxygen which we were then using in our other thyroid cases, convinced us that—in our hands, at least—it was superior to local anesthesia; and we continued its use until we took up ethylene-oxygen the last part of 1924. Thus most of these cases have been done under nitrous oxid-oxygen anesthesia.

Nitrous oxid-oxygen is a most excellent anesthetic except for the anoxemia which inevitably accompanies its use. After the fatal case cited above, we were so impressed with the dangers of this anoxemia that we started the use of ether added to nitrous oxid-oxygen in just enough quantity to avoid any anoxemia. This combination makes one of the safest and best anesthetics which we know. However, we believe ethylene-oxygen, which we have lately begun to use, is even better. We feel that it is better because more oxygen can be used with it, so that less ether is necessary, and because blood pressures, pulse rate, and respiration are less elevated. There is somewhat more nausea and vomiting immediately after its use, but this is not prolonged. On the whole, we have been very much pleased with its action, and from our experience with both we believe it to be a decided advance over nitrous oxid-oxygen.

Ether as the sole anesthetic we have not used because it needlessly upsets the patient for an operation in which a weaker anesthetic is perfectly satisfactory. Its unpleasant after-effects have been clearly seen in those patients having nitrous oxid-oxygen or ethylene-oxygen who have also had an appreciable amount of ether. Their recovery has been distinctly more troubled than has the recovery of those who have had no added ether. In spite of this after-effect, the increased safety which it affords when added to the gas anesthetics during anesthesia in this group much more than counterbalances this disadvantage.

MANAGEMENT OF THE ANESTHESIA

It is desirable with these cases to use a certain amount of preliminary medication. All of them are toxic, and where toxicity is present it is very desirable to allay preoperative apprehension, as this increases the metabolism and frequently markedly raises the pulse rate. Most of the patients in this series have been done with morphin and scopolamin, and with most of them the action has been very pleasing. A few, however, have shown undue depression of respiration and circulation. One man in particular was thrown into such an alarming condition that it was thought unsafe to operate at the time. He was later successfully operated upon without scopolamin. We, therefore, now use morphin alone without scopolamin and under its use have seen no cases of undue depression. Where the general condition is good, ¼ grain may be given two hours before operation, and this dose may be repeated one hour before operation. With the older patients, or when the general condition is not satisfactory, one of these doses may be omitted, so that the paient receives a total dose of ¼ grain. There are hardly any cases that are not benefited by at least ¼ grain of morphin.

As practically all these cases are in *auricular fibrillation*, the pulse rate taken in the usual way, at a peripheral artery, is unsatisfactory, because there is frequently a *pulse deficit*.. A better practice, and one which we have recently adopted, is to take the heart rate by means of a stethescope, the bell of which, is fastened over the precordium. The rate as taken by means of the blood pressure stethescope is also good in these individuals, as they practically all have thin arms. In the few comparisons which we have made, these two latter methods agreed very well with each other, even when there was a deficit in the pulse taken by palpation in a peripheral artery.

In conducting the anesthesia, it is quite desirable to avoid anoxemia. With those whose general condition is good, a slight amount of anoxemia does not seem to have any ill effect, but with the majority of these patients, it is not desirable, and with those in poor general condition, it should be avoided absolutely. Anoxemia occurs most commonly during induction, during attempts to gain depth, and during obstruction to respiration. Induction should be slow, and during its course the patient should be critically watched. That one cannot be too careful is evidenced by the fatal case already cited. Where a preliminary narcotic has been given, depression of respiration is more apt to occur than without such narcotic. It is well, therefore, where premedication has been given, to use a sufficient amount of carbon dioxid during induction to avoid any depression of respiration. By the use of this gas, a fairly rapid induction can be given which is yet free from any depression either of respiration or of circulation. As soon as induction is finished, the carbon dioxid should be discontinued, unless the respiration tends unduly to depression, and the rest of the anesthesia conducted with ethylene-oxygen alone. If too much carbon dioxid is used, respiration is unduly stimulated and a slight added burden is thus thrown on the heart.

If at any time sufficient depth cannot be obtained without cyanosis or evidences of impaired circulation, it is far safer to add a little ether than it is to attempt to gain depth by forcing the gases.

Great care should be taken to keep the air-way free, and if nevertheless, it does become obstructed, oxygen should be used early and freely and respiration should be assisted by pressure on the breathing bag during inspiration.

It is not well, in trying to avoid anoxemia, to go

to the other extreme and keep these patients too light. If they are too light they may be bothered by the presence of mucus in the trachea, with the result that the anesthesia is interrupted by cough, spasm and apnea, with resulting anoxemia and cyanosis. The middle course and the addition of ether, avoids the evils of each extreme and of each anesthetic.

We believe that there should be practically no deaths on the operating table. In a group of patients, all of whom are such bad risks as are these, it is perhaps unwise to make the absolutely unqualified statement that there should be none. But from a consideration of our one such death and from our experience with some of the worst of the other cases, we feel that with the use of ethylene-oxygen, with a slow and careful induction, and with the discreet use of carbon dioxid and ether to avoid at all times any depression of either respiration or circulation, these cases will be found to be surprisingly safe.

Postoperative Care

Postoperative care of the thyro-cardiac has not been a great problem. Our cases have not had clear aggravation of their signs of failure. Reactions to be looked for following thyroid surgery in toxic cases, such as vomiting, fever, very rapid heart and respiration, and delirium, have been conspicuously absent in this group. Rest, by all reasonable means; digitalization of those with auricular fibrillation; and Lugol's solution in suitable cases, is continued.

A few individuals of the number that have required operation in more than one stage, have lost their signs of failure after the first operation, been up and about, and allowed to go home under careful restrictions, before the second operation. A few of these have returned with signs of congestive heart failure again present. It seems now to be a clinical law that thyro-toxic patients with congestive failure must be kept in the hospital until the final operation is completed. It is impossible to pick individuals who may still be toxic who can safely be allowed away from hospital restrictions.

We believe that this group of thyro-cardiac patients represents the most satisfactory and gratifying one of all the thyroid cases upon which we have operated. It includes seventy individuals who have been operated upon, with two operative deaths; and our demonstration of the capacity of the heart in these cases to regain and maintain compensation after the removal of the underlying thyroidism, which causes it to break its compensation, together with the demonstration that those apparently hopeless cases could be operated upon, has been by far the greatest advance which we have made in our clinic in the management of thyroid disease.

Conclusions

It has been only by the close association of anesthetist, cardiologist and surgeon that this has been made possible. The cardiologist urged us in the beginning to undertake this seemingly hopeless group. He has prepared our cases so that they could have whatever slight improvement was possible before operation.

The anesthetist by careful approach has demonstrated to us that a general anesthetic could be administered to these cases quite safely, if the precautions which he has described were observed and the technical steps, then, of the removal of the thyroid have not been difficult.

638 Beacon St.

Book Reviews

Operative Dentistry for Children. By M. Evangeline Jordan, D.D.S., Los Angeles, Calif. Octavo, pp. 182, with 158 Illustrations. Publishers, Dental Items of Interest Publishing Co., Brooklyn, N. Y., and London, England, 1925.

There is an increasing need and demand for good dentistry for young children; not children in groups in school clinics, or other public bureaus, but children in private practice, where advantage of every device at hand may be taken to promote the highest welfare of these little patients; and Dr. Jordon's is a text book dealing with this problem of prophylactic and curative treatment of the teeth of the child, based upon experience gained during more than 25 years devoted to the dental care of children exclusively.

The laity is asking for this service and appreciates it and it would seem that every town in America needs at least one dentist with a definite knowledge of the treatment of little children especially in relation to diseased *deciduous teeth* so that a firm foundation for future health and perfect dentures may be laid for the present generation of children. The dental colleges could well afford to train their students for doing this definite work in starting their professional careers. Rendering such service also lays the foundation upon which to build a future practice.

Dentists should be prepared to do thorough constructive work from the earliest period at which parents can be induced to have their children attended to and there is great need for work on the first teeth as 80 per cent of school children suffer from *dental caries*—a preventable disease of childhood due to incorrect diet and lack of care. Were dentists to make up their minds to do so, dental caries could be eradicated in a generation, according to Dr. Jordon, as certainly as have been yellow fever and the plagues.

No doubt a great deal of Dr. Jordon's success is due to the fact that she loves and understands children and has developed ways and means for their management in the office and for their cooperative acceptance of the work that must be done. These ways and means she explains in detail in several of the most interesting chapters of her book on management, equipment and stories to be used. These chapters reveal Dr. Jordon as a mistress of *child psychology*.

Out of her quarter century of experience she considers such topics as diagnosis, oral propylaxis, reasons for filling children's teeth and then enters upon the technic of cavity preparation and filling materials and their application. She discusses those medicines which she has found most useful in operations for children and considers such problems as devitalization of deciduous pulps and the treatment of abscessed deciduous teeth and extractions.

In an effort to forestall malocclusions Dr. Jordon considers the care of the first (permanent) molar, amputation of pulps in undeveloped permanent teeth and the effects of diet upon teeth and dental caries.

All in all Dr. Jordon's book is a remarkable contribution to the practice of dentistry and its future development and it may well serve as the structure about which may be builded a life's career in this service.

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F. HOEFFER McMECHAN, A.M., M.D., *Editor*
Avon Lake, Ohio, U.S.A.

JULY EDITORIALS 1925

DOGS OR PATIENTS

A curious situation would seem to be developing in medical education with regard to the relations of laboratory courses (pure science), to the clinical courses or work at the bedside and in the operating room. This situation has been thrust upon the Editor by several recent incidents.

Several years ago a research week in the laboratory of pharmacology of a well known medical school was used to direct considerable criticism against a professor of pharmacology who had had the temerity to transmute pure science into practical application for a group of specialists in anesthesia who were anxious to bring all the latest resources of pharmacology to bear upon the problems of safety-first anesthesia in surgery.

During the Atlantic City Congress of Anesthetists an equally prominent pharmacologist bemoaned the fact that the university medical school with which he was connected had no one in charge of clinical anesthesia who was interested or competent enough to bring the current advances of pharmacology of his own laboratory into clinical practice.

Still more recently an associate in pharmacology inquired for an opportunity of securing clinical knowledge of anesthesia for promotion to an assistant professorship. In correspondence in this matter the Editor was very much surprised to find out that this effort at perfection was to remain limited to the pharmacological laboratory and that those concerned in teaching the pharmacology of anesthetics had no interest whatever in seeing that their instruction to the medical students eventuated in anything of value to patients.

It would seem that certain pure scientists are very much interested in having their experimental animals given the choicest anesthesia service but they consider any further use of such knowledge transmitted to their students and used for the benefit of suffering humanity as inconsequential.

It is certainly to be hoped that this last mentioned attitude will not prevail. Tax payers are supporting medical schools so that not only the clinical teaching but also the laboratory courses will contribute to the benefit of the ill and suffering. To accord dogs a type of anesthesia in the laboratory which outclasses that given patients by students or nurses in teaching hospitals, is something that challenges public confidence in medical education and may lead to an impeachment of pure science and a loss of prestige on the part of the medical profession.

The Editor is quite confident that medical school and pure science have much more to gain if every effort is made to enable students and clinicians to utilize all the knowledge that can be derived from the laboratory courses and research, in the wards and operating rooms of the surgical pavillions.

After all medical schools do not exist primarily to develop research workers. Their excuse for existence is the training of doctors to care for the sick and in doing this students and interns must be provided with a mechanism of development which does not leave their work and knowledge in the laboratory sterile of any results in actual practice.

The basic sciences can only serve themselves if they also serve humanity.

If the Fourth Era of Surgery, about which so much is heard today, is really to stand for something, then the medical schools and the teachers of the basic sciences must cooperate with the clinicians and specialists in providing the foundation for real advancement. It would seem that those in practice must occasionally go back into the laboratory, or those in the laboratory must continually send out their further progress through the latest students.

The Associated Anesthetists are deeply concerned in the solution of this problem both for the sake of dogs and the patients.—McM.

Eastern Society of Anesthetists
Hotel Adelphia, Philadelphia, October 26-29
(Clinical Congress of Surgeons Week)

Southern Association of Anesthetists
Jefferson Hotel, Dallas, Texas, November 10-11
(Southern Medical Association Week)

Society Proceedings

FIFTH ANNUAL MEETING CANADIAN SOCIETY OF ANESTHETISTS

The Canadian Society of Anesthetists held its Fifth Annual meeting jointly with the Ontario Medical Association at the King Edward Hotel, Toronto, May 6-8, 1925.

Dr. Walter L. Muir, Halifax, retiring President opened the meeting Wednesday afternoon by presenting the historic gavel, which was accepted by the incoming President, Dr. John J. Buettner, Syracuse, N. Y.

Dr. A. Primrose, Dean of the Faculty of Medicine, University of Toronto, then gave the Address of Welcome in behalf of the Ontario Medical Association and the local profession.

This was followed by the scientific sessions during which the following papers were presented and discussed:

Anesthesia in Retrospect: Presidential Address.
John J. Buettner, M.D., Syracuse, N. Y.

Anesthesia in Children.
Charles H. Robson, M.B., Toronto.

The Use of Ethylene in Tonsillectomy.
Don A. Warren, M.B., Hamilton.

Combined Anesthesia in Thyroidectomy.
T. R. Hanley, M.B., Toronto.

On Thursday morning Drs. C. M. Brown and J. H. Evans of Buffalo, N. Y., demonstrated tonsillectomy under nitrous oxid-oxygen anesthesia at the Toronto General Hospital. Later Prof. V. E. Henderson and Dr. W. Easson Brown gave a demonstration of propylene anesthesia in the Laboratory of Pharmacology, Medical Building, University of Toronto and during this laboratory period Prof. V. E. Henderson spoke on "The Practical Application of the Theory of Anesthesia;" and Dr. W. Easson Brown not only took propylene personally but also showed how intratracheal anesthesia can be given experimental animals under water without any aspiration into the windpipe.

On Thursday afternoon the Canadian Anesthetists were accorded places on the program of the Ontario Medical Association and the following papers were presented:—

What the General Practitioner Should Know About Anesthetics for Use in His Own Practice.
Samuel Johnston, M.A., M.D., Toronto.

The Evaluation of Surgical Risks from the General Practitioner's Viewpoint.
F. H. McMechan, A.M., M.D., Avon Lake, Ohio.

During the regular scientific session which followed in the Blue Room the following papers were presented:—

Blood Pressure Guides and Safeguards in Anesthesia With Special Reference to the Energy Index.
John H. Evans, M.D., Buffalo, N. Y.

Anesthesia in Thyroid Surgery.
Lincoln F. Sise, M.D., Boston.

The Preoperative Preparation of the Supposedly Fit.
Prof. Wm. A. Groat, M.D., University of Syracuse, N. Y.

On Friday morning Dr. E. I. McKesson demonstrated pure gas-oxygen anesthesia for open mouth surgery at the Toronto General Hospital and Dr. Harry J. Shields, demonstrated the management of poor surgical risks and especially the method of continuous blood transfusion. At the Hospital for Sick Children Dr. Charles Robson and his associates demonstrated the newer methods of anesthesia for children and especially exsanguination transfusion for the control of toxemias.

During the scientific session on Friday afternoon the following papers were presented:—

Lung Complications in 1000 Consecutive Cases at the Royal Victoria Hospital.
J. W. Armstrong, M.B., Montreal.

Some Observations on the Management of the Poor Surgical Risk.
Harry J. Shields, M.B., Toronto.

A Glimpse at Surgery Before the Days of Anesthesia.
W. B. Howell, M.D., Montreal.

Some Relations of Metabolism to Premedication and Anesthesia.
F. W. Clement, M.B. and E. I. McKesson, M.D., Toledo, O.

During the Executive Session the Minutes of the previous meeting and the Treasurer's Report were accepted as presented.

The following nominations for Officers and the Executive Committee were made and the Secretary was instructed to cast a ballot for their election:—President, Charles LaRocque, Montreal; Vice-President, Charles H. Bastin, Vancouver; Secretary Treasurer, Harry J. Shields, Toronto; Executive Officer for Great Britain, Z. Mennell, London, England; Executive Officer for the United States, E. A. Tyler, Philadelphia; Executive Committee, A. F. Foss, Montreal, W. J. DeFries, Toronto, D. C. Aikenhead, Winnipeg and M. S. Macdonald, Sherbrooke, P. Q.

All the social events of the meeting were in common with those of the Ontario Medical Association and on Wednesday evening the Canadian Anesthetists and their ladies enjoyed the Annual Dinner Dance in the Crystal Ball Room of the King Edward Hotel.

Mrs. Harry J. Shields gave a luncheon to the visiting ladies at the Country Club in behalf of the Canadian Anesthetists on Wednesday. Mrs. F. H. McMechan gave a luncheon for the wives of Canadian Anesthetists at the King Edward in behalf of the Associated Anesthetists on Friday. The Visiting Ladies were also entertained at tea at the Academy of Medicine of Toronto, the Army and Navy Club and also at a theater party.

The time and place of the 1926 meeting was not decided on. The Toronto meeting in its papers, clinics and laboratory demonstration as well as in its attendance and the hospitality of the Toronto profession and the Ontario Medical Association, was a success in every sense of the word. The cooperation of anesthetists from the United States is also deeply appreciated.

Harry J. Shields, M.B., *Secretary*,
102 College St., Toronto, Canada.

FOURTH ANNUAL CONGRESS OF ANESTHETISTS

The Fourth Annual Congress of Anesthetists marked the Thirteenth Annual Meeting of the American Association of Anesthetists, now the Associated Anesthetists of the United States and Canada, which was organized during A.M.A. Week, in Atlantic City, June,.1912; and the Fifth Annual Meeting of the International Anesthesia Research Society.

Sessions and exhibits were held in the Egyptian Roof Garden of The Breakers, Atlantic City, from May 25 to 28.

The Congress was opened by the presentation of the gavel by Dr. E. A. Tyler, Philadelphia to Dr. Wesley Bourne, Montreal, the incoming President who then presided at the various sessions which followed. The gavel presented on this occasion was a gift of Dr. Bourne to the Associated Anesthetists for use as its historic memento.

The following papers were presented and discussed in the Monday morning session devoted to Technical Advances:—

The Chemistry and Physics of "Dry" Nitrous Oxid.
Walter S. Crowell, B. Sc., Chief Chemist, The S. S. White Dental Mfg. Co., Philadelphia.

Further Purification of Nitrous Oxid by Finely Divided Metals and the Manufacture of Cotton Process Ethylene.
M. B. Cheney, B. Sc. and Arthur Michalske, B. Ch., The Cheney Chemical Co., Cleveland, O.

The Problem of Ethylene Explosions.
Isabella C. Herb, M.D., Presbyterian Hospital, Chicago, (By Proxy).

Anesthesia From the Biophysical Standpoint, (Demonstration).
Donald C. A. Butts, Ph.D. and E. A. Tyler, M.D., American Chemical Laboratories and Hahnemann Hospital, Philadelphia.

The Monday afternoon session was devoted to Newer Anesthetics and Gas Therapy and the following papers were presented and discussed:—

Studies of the Physiological Action of Some Unsaturated Hydrocarbons, (P-G Lecture and Demonstration).
Lloyd K. Riggs, Ph.D., and Harold D. Goulder, B. Sc., Squibb Research and Biological Laboratories, New Brunswick, N. J.

Observations on Some Newer Anesthetic Gases.
W. Easson Brown, M. B. and V. E. Henderson, M.D., Toronto University, Toronto, Canada.

Acetylene-Oxygen, The Ideal General Anesthetic for Extractions and Oral Surgery.
Aaron Goldman, D.D.S. and Julius D. Goldman, D.D.S., New York City.

Possibilities in the Use of Helium-Oxygen Mixtures as a Mitigation of Caisson Disease, and a Consideration of the Anesthetic Properties of Helium.
R. R. Sayers, M.D., Chief Surgeon, U. S. Bureau of Mines, Washington, D. C.

A Special Session was held on Monday evening during which Prof. C. D. Leake, University of Wisconsin gave an illustrated talk on "Some Interesting and Unusual Incidents, Documents and Personalities of the Historical Evolution of Anesthesia."

Anesthesia and the Respiratory Function was the topic of the Symposium for the Tuesday morning sessions during which the following papers were presented and discussed:—

The Chemical Control of Respiration, (P-G Lecture).
Robert Gesell, M.D., Univ. of Michigan, Ann Arbor, Mich.

A Further Consideration of Certain Bodily Reactions to Anoxemia.
C. W. Greene, Ph.D., Univ. of Missouri, Columbia, Mo.

Central Control of the Heart Rate During Acapnia and Asphyxia.
Aleita Hopping, Ph.D., Columbia University, New York City.

Studies in Alpha-Lobelin Resuscitation.
Herbert S. Reichle, M.D., Irvington, N. J., and Kurt Peters, M.D., New York, N. Y.

The Symposium on Handling Hazardous Risk Patients on Tuesday afternoon was opened by the Presidential Address and a number of prominent surgeons took part by presenting supplementary papers:—

Recent Advances in Anesthesia, (President's Address, Associated Anesthetists of the United States and Canada, 1925).
Wesley Bourne, M. Sc., M.D., McGill University, Montreal, Canada.

The Surgical, Medical and Anesthesia Problems of the Toxic Goiter Case with Heart Failure.
Frank H. Lahey, M.D., Burton E. Hamilton, M.D., and Lincoln F. Sise, M.D., The Lahey Clinic, Boston.

Determining the Safe Operating Time in Head and Spinal Operations.
William Sharpe, M.D., New York City.

Reduction of Operative Risk in Intestinal Obstruction.
Thomas G. Orr, M.D. and R. L. Haden, M.D., Univ. of Kansas, Kansas City, Kan.

Blood Transfusion as a Routing Measure in Poor Operative Risks.
George Gray Ward, M.D., Cornell University Medical College and Woman's Hospital, New York, N. Y.

The Question of Anesthesia from the Standpoint of the Urologic Surgeon.
Oswald Swinney Lowsley, M.D., New York City.

On Wednesday morning the attention of the Congress was focused on Anesthesia and the Circulatory Function and noted research workers and clinicians presented the following pertinent papers:—

Observations on the Action of Ether on the Circulatory System, (P-G Lecture).
McKeen Cattell, Ph.D., Cornell Univ. Medical College, New York City.

Early Manifestations of the Human Dying Heart.
Morris H. Kahn, M.D., New York City.

The Adrenals as Dominant Factors in Respiration and their Bearing as Such Upon Anesthesia.
C. E. de M. Sajous, M.D., F.A.C.P., Philadelphia.

Treatment of Surgical and Anesthetic Shock With Insulin-Glucose.
David Fisher, M.D., National Military Hospital, Milwaukee, Wis.

Blood and Tissue Chemistry in Relation to Safety-First Surgery and Anesthesia was the topic of the Wednesday afternoon Symposium during which the following papers were presented and discussed:—

Blood Chemistry in Relation to Surgery and Anesthesia, (P-G Lecture).
John A. Killian, Ph.D., N. Y. Post Graduate School and Hospital, New York City.

The Metabolism of the Diabetic Before and After Anesthesia.
I. M. Rabinowitch, M.D., Montreal General Hospital, Montreal, Canada.

Observations in Blood and Tissue Chemistry in Relation to Anesthesia and Safe Operating.
Henry M. Feinblatt, M.D., Brooklyn, N. Y.

Acid-Base Balance Changes During Operative Anesthesia.
Alfred E. Koehler, M.D., Ph.D., Henry Ford Hospital, Detroit, Mich.

On Thursday morning papers and demonstrations on Newer Tests for Evaluating Surgical and Anesthetic Risks held the attention of the Congress with the presentation and discussion of the following papers:—

Evaluating Cardiac Risks and Observations on Certain Blood Pressure Reactions to Passive Postural Changes as an Index of Myocardial Efficiency.
M. A. Mortensen, M.D., Battle Creek Sanitarium, Battle Creek, Mich.

Response of the Cardio-Vascular System to Respiratory Exertion.
Harold M. Frost, M.D. and H. H. Amiral, M.D., Medical Dept. New England Mutual Life Insurance Co., Boston.

Tests for Disclosing Sympathicotonia and Vagotonia.
J. Bernard Cohen, M.D., New York City.

The Routine Evaluation of Surgical and Anesthetic Risks.
Henry S. Ruth, M.D., Hahnemann Hospital, Philadelphia.

Some Relations of Metabolism to Pre-Medication and Anesthesia.
E. I. McKesson, M.D., and F. W. Clement, M.B. (Tor.), Toledo, Ohio.

The closing scientific session of the Congress was devoted to a general program of papers on Ether, Nitrous Oxid and Ethylene Anesthesia:—

The Fate of Ether in the Body, (P-G Lecture).
Howard W. Haggard, M.D., Yale Univ. Medical School, New Haven, Conn.

The Effect of Nitrous Oxid, Ethylene, Ether and Chloroform on the Contractions of the Stomach, Small Intestines and Colon During General Anesthesia.
G. H. Miller, M.D., State University of Iowa, Iowa City.

Postoperative Pulmonary Complications Following Anesthesia.
I. S. Ravdin, M.D. and Richard Kern, M.D., Univ. of Pennsylvania, Philadelphia.

Carbon Dioxid-Oxygen Mixtures in Relation to Etherization and the Control of Hemorrhage in Throat Operations.
Cline N. Chipman, M.D., Washington, D. C.

A Consideration of 4000 Nitrous Oxid-Oxygen Anesthesias.
John K. Musgrave, M.D., Western Pennsylvania Hospital, Pittsburgh, Pa.

The Annual Dinner Dance was held on Tuesday evening in the Crystal Room of The Breakers and during this festive occasion the Associated Anesthetists presented a silver Loving cup to Dr. Wesley Bourne, President, in recognition of his research work and especially for his organization of the Canadian Society of Anesthetists.

In behalf of the International Anesthesia Research Society Dr. Bourne presented a Scroll of Recognition to Profs. Yandell Henderson and Dr. H. W. Haggard; and Dr. John H. Evans, presented a Scroll of Recognition to Profs. A. W. Rowe and W. L. Mendeehall for Meritorious Researches in Anesthesia and Analgesia. Aside from the dancing those in attendance had the pleasure of hearing Mrs. A. H. Miller and Dr. E. A. Tyler render some exquisite vocal selections. They were accompanied on the piano by Mrs. Millard.

During the Executive Session on Wednesday evening the Minutes of the previous meeting and the Treasurer's Report were accepted as presented.

The following new members were elected to the Associated Anesthetists:—Drs. M. L. Axelrod, Cleveland; Wilmer Baker, New Orleans; Jos B. Bogan, Washington, D.C.; E. Leslie Burwell, New Rochelle, N. Y.; James H. Cotton, Toronto; John C. Dessloch, Rochester, N. Y.; Mabel Adams Gerard, Phoenix; Aaron B. Gates, Greenwich, Conn.; A. C. Gray, Washington, D. C.; Louis L. Greenblum, Akron, O.; H. R. Griffith, Montreal; Helen Haynes, Brockton, Mass.; C. Wm. Hoeflich, Houston; Wm. W. Hutchinson, Los Angeles; P. A. Kibbe, New Orleans; John J. O'Dowd, New York; Henry S. Ruth, Philadelphia; Harry M. Seldin, Brooklyn; Harry J. Shields, Toronto; Aida Sloan, Washington, Pa; Anna M. Stuart, Elmira, N. Y.; Oscar Hagen Stover, Buffalo, N. Y.; Anna Topaz, Providence, R. I.; Earl C. Wagner, Asbury Park, N. J.; R. L. Wall, Winston-Salem, N. C.; Amy Weiss, Chicago, and M. J. Wilson, Warsaw, N. Y.

The following nominations for Officers, Executive Committee, Advisory Council and Council on Teaching and Hospital Service were presented and the Secretary was instructed to cast a ballot for their election:

John H. Evans, M.D., Buffalo, President-Elect; Gervaise E. Johnson, M.D., San Antonio, 1st Vice-President; Wm. W. Hutchinson, M.D., Los Angeles, 2nd Vice-President; Henry F. Becker, M.D., Danville, Ill., 3rd Vice-President; F. H. McMechan, M.D., Avon Lake, O., Secretary General; Executive Committee, Edith McKay Ross, M.D., Winnipeg, J. Wade Elphinstone, M.D., Pittsburgh, J. Robert Burrows, M.D., San Francisco, Edw. H. Lane, M.D., East St. Louis, E. E. Allgeyer, M. D., New Orleans; Advisory Council, Charles LaRocque, M.D., Montreal, H. J. Shields, M.D., Toronto, A. F. Erdmann, M.D., Brooklyn, Chas. J. Wells, M.D., Syracuse, Thos. J. Collier, M.D., Atlanta, Wm. H. Long, M. D., Louisville, C. C. McLean, M.D., Dayton, O., R. M. Waters, M.D., Kansas City, R. F. Hastreiter, M.D., Los Angeles, Eleanor Seymour, M.D., Los Angeles; Council on Teaching and Hospital Service, Isabella C. Herb, M. D., Chicago, B. H. Harms, D.D.S., Omaha, Ansel M. Caine, M.D., New Orleans, Cline N. Chipman, M.D., Washington, D. C., Theo. D. Casto, D.D.S., Philadelphia, Chas. H. Sanford, M.D., New York, Wm. Webster, M.D., Winnipeg, W. Easson Brown, M.D., Toronto, Mary E. Botsford, M.D., San Francisco, Wm. A. Millington, M.D., Seattle.

In behalf of the International Anesthesia Research Society Dr. John H. Evans presented the following Board of Governors for approval and the Secretary was instructed to cast a ballot for their election:—Drs. John H. Evans, Buffalo, Chairman; E. Klaus, Cleveland, Vice-Chairman; F. H. McMechan, Avon Lake, O., Editor-Executive Secretary; Wm. Hamilton Long, Louisville, Eleanor Seymour, Los Angeles, E. A. Tyler, Philadelphia, Don A. Warren. Hamilton, Canada and Chas. J. Wells, Syracuse, N. Y.

In behalf of the International Anesthesia Research Society the Editor-Executive Secretary reported that the Board of Governors had under advisement a further enlargement of Current Researchs in Anesthesia and Analgesia and an increase in the subscription price for which those who provided this additional support could have a complimentary subscription sent to any library of a county society, medical or dental school or intern hospital. This policy was being adopted to bring the message of better anesthesia to the profession as a whole.

The Advisory Council reported on the success of the Toronto and Yosemite meetings and also announced that the Eastern Anesthetists would meet during Clinical Congress of Surgeons Week, October 26-29 at the Hotel Adelphia, Philadelphia; and the Southern Anesthetists during Southern Medical Association Week, November 10-11 at the Jefferson Hotel, Dallas, Texas.

The Council on Teaching and Hospital Service reported that it was cooperating with the similar Council of the A.M.A. in surveying those teaching and intern hospitals in which anesthetic experience and instruction were not meeting essential requirements. Also the Louisville plan for Anesthesia Service in teaching hospitals was being brought to the attention of those interested and concerned.

In a discussion of the program for future meetings it was decided to limit each session to not more than five papers and that ordinary papers be limited to 20 minutes in presentation and postgraduate lectures and demonstrations to 40 minutes; and discussants to 3 minutes each.

A special committee was appointed consisting of Drs. Wesley Bourne, E. I. McKesson, John H. Evans, W. Hamilton Long and Eleanor Seymour, to devise ways and means of sending Dr. and Mrs. F. H. McMechan to Europe in 1926 to further international relations in the specialty.

As usual the balance in the treasury was voted to the Secretary General in appreciation of services rendered during the past year.

During the Congress the following manufacturers staged commercial exhibits of pertinent products:—The Cheney Chemical Co., Cleveland O.; The Clarke Chemical Co., Wickliffe, O.; Ernst Bischoff Co., Inc., New York City; The Foregger Co., Inc., New York City; The Ohio Chemical & Mfg. Co., Cleveland, O.; E. R. Squibb & Sons, New York City; Toledo Technical Appliance Co., Toledo, O. and The S. S. White Dental Mfg. Co., Philadelphia.

The Visiting Ladies were entertained at luncheon, theater parties, motor drives and Boardwalk rides as well as the reception and tea of the A.M.A. at Vernon Hall.

Aside from a slight decrease in attendance over previous years on account of the financial depression, the Fourth Annual Congress was a great success and augurs well for the future of the specialty.

F. H. McMechan, M. D., *Secretary General*,
Avon Lake, Ohio.

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